The

Journal of Agriculture.

VOLUME IX, No. 3. | WELLINGTON, N.Z., 21ST SEPT., 1914. | PRICE, SIXPENCE.

ROOT TRIALS AT RUAKURA.

PRIMROSE MCCONNELL.

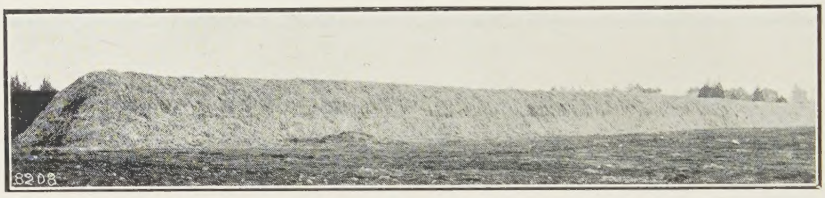
A VERY important feature of the experimental work at the Ruakura Farm of Instruction is the endeavour to discover the most economical methods of producing root crops for stock-feeding purposes. It is realized that the best manurial treatment for roots—that which will give the most satisfactory result comparative with cost—is of first importance to the farmers of the province; while ascertaining the best varieties for the district is also regarded as a necessary phase of the farm's activity.

The main crop of roots (mangels, swedes, and turnips) in the experiments of the 1913–14 season was grown in No. 14 paddock. The previous main crop of the season on this area was oats, followed by a catch-crop of tares and barley, which was fed on the land.

Mangels.

There is not the slightest doubt that the tares had a very beneficial effect on the root crop, as is evidenced by the comparatively high yield from the unmanured plot. In previous seasons unmanured mangels have yielded from only 2 to 10 tons per acre.

From the 10th to the 25th June—after the catch-crop was fed off—the land was ploughed with the "digger" plough to a depth of 8 in. In September it was twice tine-harrowed, double-disked, and cross-ploughed with the "digger." In October the land was twice tine-harrowed and Cambridge-rolled. The mangel-seed was sown from the



One of the Mangel-clamps at the Ruakura Farm of Instruction.

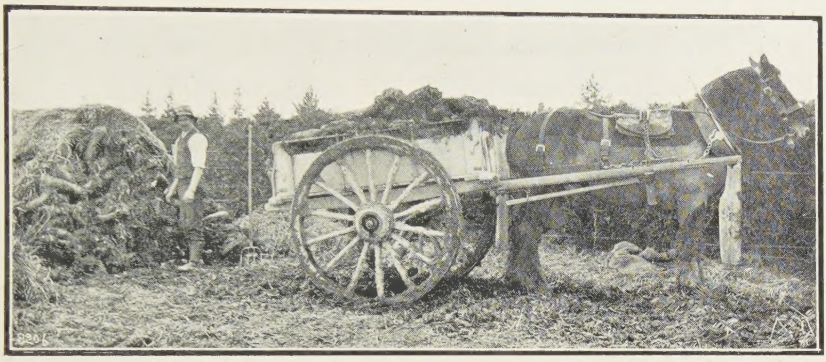
When the photograph was taken a length of 60 yards had been already carted from one end. The complete clamp was computed to contain 500 tons of mangels.

A. W. Green, photos.] One End of the Big Clamp.

13th to 16th October, with the double ridger, at the rate of 6 lb. per acre, the rows being 27 in. apart. In sowing with the ridger about two-thirds of the manure goes to the bottom of the ridge, through the manure-coulter, the remainder passing into the seed-coulter. The plants were afterwards singled out to about 12 in. apart in the rows. The whole crop was four times horse-hoed during the season.

Six weeks previous to sowing the seed one-third of the whole field was dressed with 2 cwt. kainit per acre, one-third with agricultural salt, and the remainder undressed. Neither application gave the slightest result on any of the root crops.

During the latter part of June and the beginning of July the mangels were stored in Λ-shaped clamps, and these were covered with waste straw. The tops were cut off with a sharp hoe, and the roots were thrown into the carts direct from the rows, without any harrowing-out. It has been found that the harrowing effects no economy in the cost



A. W. Green, photo.] CARTING OUT THE RUAKURA MANGELS.

of storing, while it causes some slight injury to the bulbs. In the case of Globe or Tankard mangels it is less labour to throw them into the carts direct from the rows than after they have been harrowed out.

The following table gives the results from the variety and manurial tests :—

Variety Tests.

The fertilizer applied was a mixture of 404 lb. basic superphosphate and 269 lb. bonedust.

Variety.	Yield. Tons.
Yellow Globe	71
Red Intermediate	70
Prizewinner Globe	66
Jersey Queen	75
Long Red	68
New Sugar	48
New Lion Intermediate	54
New Smithfield Yellow Globe	68
Golden Gate-post	65
Golden Tankard	62
Red Globe	55
Gate-post	57
Golden Globe	48
Yellow Intermediate	68

Many of the varieties were more or less affected with the rhizoctonia-disease, the soundest varieties being Red Intermediate and Long Red.

Manurial Tests on Jersey Queen Mangel.

Plot.	Manures applied per Acre.	Yield per Acre.	Gain by Manuring.
		Tons.	Tons.
1	Unmanured	22·90	..
2	89 lb. bonedust	46·57	23·67
	135 lb. superphosphate		
3	179 lb. bonedust	52·58	29·68
	269 lb. superphosphate		
4	269 lb. bonedust	55·71	32·81
	404 lb. superphosphate		
5	620 lb. superphosphate	52·81	29·91
6	672 lb. Christmas Island guano	40·04	17·14
7	269 lb. bonedust	75·00	52·10
	404 lb. basic superphosphate*		

* Basic superphosphate is a combination of lime and superphosphate, obtained by the mixing of 15 per cent. of quicklime with superphosphate. The addition of the lime reverts the water-soluble phosphoric acid to a form which is insoluble in water, but is readily available for the plant. In contradistinction to superphosphate, basic superphosphate is not an acid manure, and therefore does not increase the acidity of the soil.

The principal feature in the manurial results is the high yield from basic superphosphate, in comparison with superphosphate, when mixed with bonedust in similar proportions. The steady increase of yield resulting from a similar increase of manure in plots 1, 2, 3, 4, is also worthy of note.

The mangel is undoubtedly an expensive crop, but with liberal treatment it pays handsomely. A small crop of from 10 to 20 tons is grown at a dead loss, while a yield of from 50 to 70 tons will give a highly profitable result. A mangel crop treated on the above lines will cost about £5 per acre (all expense included), or, in other words, a 50-ton crop will cost 2s. per ton. We are too apt to condemn a crop of this kind because of the immediate cost. Mangels come into use when all other stock-food is scarce, and they enable us not only to save the pastures, but also to keep the stock in high condition, which has a very far-reaching effect on the whole season's results.

As lucerne hay comes more into use, however, it is just possible that maize ensilage will to some extent take the place of roots and be used for dairy stock in conjunction with the lucerne hay, and it has already proved itself an excellent fodder for milk-cows.

In the mangel variety test plots it was found that seed grown on the farm from selected roots gave a higher yield of sounder roots than was had from imported seed, and the germination was much better. The work of selection is being proceeded with.

SWEDE VARIETIES.

The swedes were sown under similar conditions to the mangels, the only difference being in the manures applied.

The seed was sown on the 1st December, and the germination throughout was excellent. Over the whole of the plots the crop was

remarkably even, as the yields show. There was very little blight, the cleanest variety being Magnum Bonum.

When sheep were turned on it was noticed that they had a preference for the Superlative variety, and a few rows of kohl-rabi were left to the last.

Variety.	Yield per Acre (Tons). Roots.	Tops.
Up-to-Date..	31·80	5·90
Crimson King	35·53	5·56
Bronze-top	32·63	4·48
Queen	34·41	3·61
Magnum Bonum	34·61	5·35
New Imperial	30·00	4·48
New Buffalo	31·47	5·90
New Empire	34·00	5·90
Superlative	34·41	3·88
Gateacre	35·53	5·66
Purple-top Stubble	34·86	6·13
Monarch	32·32	4·15
Golden Melon	35·24	5·35
John Bull	33·21	3·88
Best of All	36·40	4·48
Halewood	36·11	5·66
May Day	34·40	3·88
Perfection	31·96	3·61
Cropwell	36·11	4·48
Incomparable	32·93	6·24
Kohl-rabi	20·30	..

The manure applied to the above was a mixture of 3 cwt. basic super and 1 cwt. bonedust per acre. The area of each plot was one-quarter acre.

Sixteen different manures and mixtures were under trial on the Superlative swedes, but dry weather set in immediately after sowing, and the results were further negatived by the attack of grass-grub. The best result was undoubtedly from basic superphosphate alone.

I must admit that progress in agriculture has often been hindered by too much theory and too little practice.—*Dr. Saunders, Canada.*

Nearly 100 tons of lime were applied during the month of August to the fields of the Ruakura Farm of Instruction, undressed check-plots being left in every field treated.

MAY RILMA.

THE WORLD'S CHAMPION COW.

A COMPLETE official account of the yield and method and cost of feeding of the world's record cow has been forwarded by Mr. E. Clifton, New Zealand Commissioner to the Panama Pacific Exposition, together with an excellent photograph, here reproduced, of the champion, the pedigree Guernsey cow May Rilma. She was calved on the 15th December, 1906, and commenced milking for her record on the 8th April, 1913, but for the purpose of the record her yield was taken from the first day of the following month, as she milked right through until the end of April of this year, and was then in good milking-form, her day's yield on the 30th April, the last day of the record-year, being 50·7 lb. of milk, her best day's milking being 63·8 lb. In only three months was the 60 lb. mark reached or exceeded—in May, 1913, when it was slightly exceeded on two occasions; in the next month, when over 60 lb. was given on twenty-six days; and in August, when 60 lb. was reached on three days. The yield in May, 1913, was 1,761·20 lb. of milk, testing 4·49 per cent. of fat, and in April, 1914, was 1,457·40 lb. of milk, testing 5·7881 per cent. of fat. The pounds of butter-fat given in the different months were as follow: April, 1913, 48·95 lb. (not counted); May, 79·08 lb.; June, 103·03 lb.; July, 85·21 lb.; August, 97·20 lb.; September, 94·33 lb.; October, 89·90 lb.; November, 87·61 lb.; December, 87·06 lb., January, 87·85 lb.; February, 85·44 lb.; March, 92·94 lb.; April, 81·76 lb. The official record is 19,673 lb. of milk, 5·46 average per cent., and 1,073·41 lb. of butter-fat. From the 5th April, 1911, to the 4th April, 1912, she gave 12,145·60 lb. of milk, 4·85 average per cent., and 589·07 lb. of butter-fat. The previous world's record was held by the American Holstein cow, Banostine Belle de Kol, which produced 1,058·34 lb. of fat in the year.

Nothing is said as to when May Rilma was served again, or whether the matter of breeding from her was considered. The test was, therefore, not conducted under ordinary farm conditions. According to the rules of the New Zealand semi-official register-of-merit scheme a cow must calve again within 445 days of the commencement of the test, while the record must count from the time of calving. In the case of cows four years of age or over, they must have produced a calf within 445 days of the commencement of the test.

The feeding of May Rilma during her test cost £46 6s. 10d., the main item being 3,103 lb. of bran, valued at £9 2s. 2d., while 5,475 lb. of straw used was valued at £6 11s. 1d. Other items were 109 gallons of molasses (£3 8s. 6d.); lucerne and clover hay, 1,760 lb. (£3 13s.); beet-pulp, 1,364 lb. (£4); gluten, 1,130 lb. (£3 14s.); ensilage, 4,740 lb. (£2 19s.); while cotton-seed meal, hominy, ground oats, green fodder, and carrots were fed in smaller quantities. Pasturage was reckoned at £2 10s. The wages of an attendant for the 365 days (1,095 hours at 9d.) was £41 1s. 3d. Thus we have a total cost to make the record of 1,073·41 lb. of fat of £87 8s. 1d.

THE WORLD'S CHAMPION, MAY RILMA.

POTATO TESTS AT MOUMAHAKI.

T. W. LONSDALE.

THE main potato crop for the 1913–14 season at the Moumahaki Experimental Farm was planted in field 4, which had been worked up after being in pasture for some years. The large amount of Chewing's fescue in the field rendered the operations necessary to obtain good tilth a matter of some difficulty. In the end the land was not in the best of order for the crop.

The tubers were planted in furrows 33 in. apart, and at an average distance apart of 15 in. to 18 in. in the rows. The ridges were split and the sets thus covered. It is considered that with some varieties this distance of 15 in. to 18 in. apart in the rows is too close, and with such varieties as Northern Star, Gamekeeper, Maori Chief, that better results might be obtained were the sets planted about 30 in. apart, thus allowing ample space for the development of the individual plants and a consequent greater degree of resistance to disease, a higher percentage of table-tubers, and economy in quantity of seed per acre being anticipated. It is hoped to arrange experiments in this direction during the coming season.

The mixture of fertilizers applied consisted of 2 cwt. superphosphate, 2 cwt. Malden Island guano, $\frac{1}{2}$ cwt. sulphate of potash, $\frac{1}{2}$ cwt. sulphate of iron, and $\frac{1}{4}$ cwt. sulphate of ammonia per acre.

The majority of the seed was well sprouted before planting, and this resulted in a quick growth and but few blanks. The difference between a row planted with sprouted seed and one with unsprouted seed was most marked, the former being well up almost a fortnight before the latter appeared. The crop was sprayed three times with "Vermorite," a preparation of acetate of copper. Irish blight was very prevalent. The comparative resistance to this disease by the different varieties was very decided. Two plots side by side, one of Gamekeeper and one of Up-to-Date, clearly showed that the Gamekeeper was an excellent blight-resister, while the Up-to-Date in the immediate proximity was very badly affected.

Several varieties new to the farm were grown. Of these, Maori Chief is giving most promise. This variety is said to be a sport from the Northern Star, and, like its parent, is an excellent blight-resister int his locality. The crop lifted very clean, and no disease in the tubers was observed. It is intended to use Maori Chief for single-tuber selection, and improvement in this variety is probable. Already one plant has yielded tubers of a blue colour with a distinct, finely netted skin, whereas the characteristic of the variety is a parti-coloured blue-and-white tuber of Northern Star type.

As a culinary potato the Skerry Blue was most appreciated, but the yield was disappointing.

Early potatoes were planted all through the winter months and were unaffected by frosts. By sprouting hard and not planting too deep so that the hard sprout can develop into the plant without the outer tissues becoming thin and etiolated, several degrees of frost can be withstood by most varieties.

Ashleaf Kidney was distinctly the best-flavoured and best all-round early. This variety proved very susceptible to blight, and the seed is very scarce.

The origin-of-seed tests were also carried out. Gamekeeper and Up-to-Date both gave the highest returns from seed originally obtained from Canterbury and grown at Moumahaki the previous season.

Appended are the yields of the different varieties.

Variety.	Ware.	Chats.	Total.
Gamekeeper (second year at Moumahaki) ..	10·50	1·92	12·42
Maori Chief	10·71	1·71	12·42
Northern Star	9·43	2·36	11·79
Gamekeeper (Canterbury)	8·04	2·96	11·00
Star of New Zealand	8·79	1·71	10·50
King Edward	7·29	2·57	9·86
Red Rock	6·00	3·86	9·86
Up-to-Date (second year at Moumahaki) ..	7·08	1·92	9·00
North Pole	6·00	1·50	7·50
Imperator	5·79	1·07	6·86
Le Breton	4·50	2·36	6·86
Ashleaf Kidney	4·29	2·36	6·65
White Rock	5·14	1·07	6·21
Skerry Blue	4·50	1·71	6·21
Eldorado	4·50	1·71	6·21
Up-to-Date (Canterbury)	4·29	1·50	5·79
Up-to-Date (third year at Moumahaki) ..	4·72	0·86	5·58
New Colonist	4·72	0·86	5·58
Spark's Victoria	4·50	0·64	5·14
Manuel's Blight-proof	4·07	1·07	5·14
Ivanhoe	4·29	0·86	5·15
Supreme	3·65	1·07	4·72
Patea Gem	3·64	1·07	4·71
Runciman's Purple	3·43	1·07	4·50
Abundance	3·43	0·86	4·29
Magnum Bonum	3·43	0·64	4·07
White Beauty	3·21	0·43	3·64
Palmer's Prolific	2·57	0·64	3·21

Eighty varieties of cereals are being tested at the Ruakura Farm of Instruction this season, in addition to 800 single-head selections.

SHOULD A HEIFER BE CULLED ON RECORD MADE AS A TWO-YEAR-OLD?

W. M. SINGLETON.

THIS question has frequently been before dairymen, but as yet there appears to be few figures on record which give an index to general results. So little testing has yet been done systematically that it is not easy for the average dairyman to ascertain what individual cases should be accepted as the rule or the exception. The results given below are gleaned from the figures of three of the "illustration" cow-testing associations operated by the Dairy-produce Division for two consecutive seasons.

Those members who were testing both seasons culled out sixty-eight two-year-olds before the commencement of the second season. As two-year-olds those which were retained had averaged 164 lb. fat, and as three-year-olds the same heifers averaged 204 lb. fat. Each dairyman must set his own standard for culling, and this must be made on very sound judgment and without playing too much to the gallery. Supposing the members of these associations had taken 148 lb. fat as their standard (which is 90 per cent. of the 164 lb. two-year-old average), some forty-eight more two-year-olds would have been deleted.

It is interesting to follow the records of these forty-eight two-year-olds during their second lactation season, when they are classed as three-year-olds. The average production of all three-year-olds (which had been tested previously as two-year-olds) was 204 lb. fat. Of these forty-eight two-year-olds retained, and which would have been culled on the 148 lb. standard, nine of them as three-year-olds yielded as much as 204 lb. fat, and for the purposes of this article will be considered as "good" heifers. Nine others would have produced as much as 90 per cent. of this three-year-old average of 204 lb.—viz., 180 lb. These three-year-olds, yielding between 180 lb. and 204 lb. fat, may be termed "fair" heifers.

The owners culled sixty-eight two-year-olds. Adding to this number the forty-eight which might have been culled, the total of culls numbers 116. Had owners culled all these after one season's testing nine good heifers in all, or one good heifer in every thirteen, would have been lost, nine fair heifers would also have been deleted, or in every thirteen disposed of one good heifer and one fair heifer would have been included.

It is probable that in keeping these forty-eight heifers which yielded below 148 lb. butter-fat as two-year-olds the owners believed they had some grounds for expecting a better yield the following season. But, instead of retaining nine good and nine fair heifers, forty-eight were retained, or for every one that should have been retained two inferior ones were also kept. It is for practical dairymen who are testing to

consider the advisability of closer culling, so that inferior heifers saved over will not nullify the profits of the good ones.

These figures tend to indicate that as a rule a heifer's record as a two-year-old is a good index to her future capacity as a producer. In a few exceptional cases heifers should be given a second chance, and more especially if they be purebred. In the majority of cases a dairyman will probably consider it more advisable to risk deleting a fair or a good heifer than to retain in addition a number of duffers for a second season in order to select that good one.

BURGOYNE'S FIFE WHEAT.

RUAKURA AND MOUMAHAKI EXPERIENCE.

Burgoyne's Fife wheat, a variety introduced by Cambridge, England, has now been tested under New Zealand conditions for several seasons. The results indicate that the decided economic value of the wheat in the country of its origin is very much the same in this part of the world.

Mr. Primrose McConnell reports as follows on the Ruakura Farm of Instruction experience: "A better crop was obtained this year than last, due chiefly to the condition of the land. Last season it followed grass, but on this occasion the preceding crop was potatoes. The land was ploughed in autumn and lay fallow during winter. In August it was again ploughed, and was several times cultivated and tine-harrowed. The seed, with 1½ cwt. each of superphosphate and bonedust, was drilled in on the 29th August. It received no treatment for smut, but there was no trace of this disease in the crop. The germination was good and an excellent stand resulted. The crop attained a height of 5 ft., but bad weather early in December caused a portion of the crop to lodge. It suffered considerably from the attack of small birds during the last week of ripening; they were more

Burgoyne's Fife Wheat at Moumahaki.

severe on this variety than any other. It was cut on the 13th January and yielded 41 bushels per acre. The grain, which threshed easily, was small, hard, and of fine quality. This is one of the best rust-resisting varieties of wheat under trial at this station. Compared with White Straw Tuscan and Solid Straw Tuscan, alongside of which it was grown, its rust-resisting qualities were most marked."

The experience at Moumahaki Experimental Farm is thus summarized by Mr. T. W. Lonsdale :—

"Two acres were sown in Burgoyne's Fife wheat, a wheat bred by Professor Biffen, at Cambridge University, by the application of principles enunciated by Gregor Mendel. This variety exhibits a high degree of resistance to rust, and thrives well at Moumahaki. A portion of the crop was cut green and made an excellent sample of chaff. Height, 4 ft. to 4 ft. 6 in. ; yield, 39·67 bushels per acre."

SEMI-OFFICIAL TESTING.

W. M. Singleton.

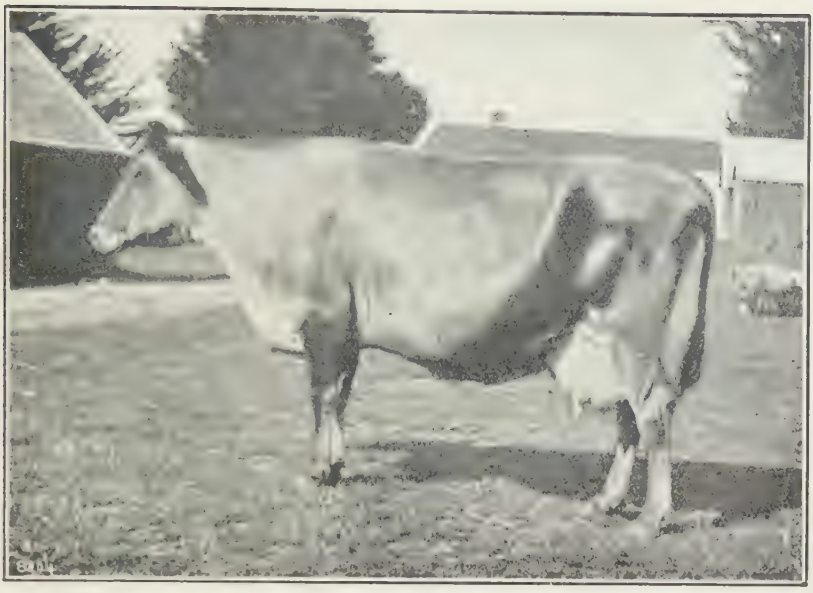
The list of records given below indicates the production of those pure-bred dairy cows which completely qualified during the month of August. This list contains some very good records, and changes the leaders in several of the classes.

In the two-year-old Holstein class Mr. J. Deacon's Butter-girl, with 511·35 lb. butter-fat, replaces Mr. W. I. Lovelock's Nancy Lee of Cliffside, with a record of 498·88 lb. fat. It was only last month that we announced Nancy Lee as the leader of her class. Pride of place stays only a short time with many leaders.

In the four-year-old Holstein class Mr. A. J. Gallichan's Diamond replaces Mr. Newton King's Countess of Galatea. Diamond's record is 440·25 lb. fat in 336 days, and Countess of Galatea produced 434·58 lb. fat in 333 days. These lactation-periods conform closely with practical work.

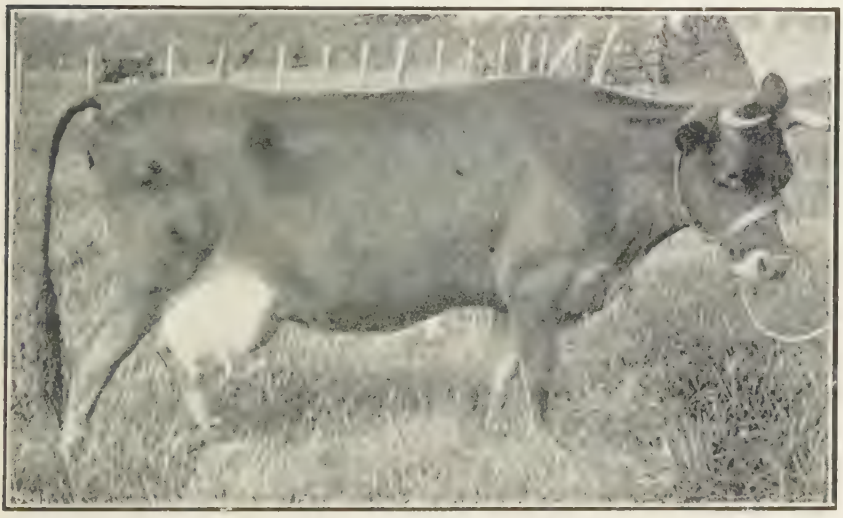
Mr. C. G. C. Dermer's Frisk, reported last month as the best mature Jersey cow, has since been beaten twice : once by Thistle VI, tested by Mr. J. Nicolson, Hawera, and now owned by Mr. R. J. Linn, of Normanby ; and again by Young Sybil, another cow in Mr. Dermer's herd. Young Sybil now leads the class of mature Jerseys, and has the highest Jersey record to date, she having produced 565·42 lb. fat in 365 days, which beats the three-year-old heifer Pepper, published last month as having a record of 546·01 lb. fat.

Last month Pepper's record was the greatest for all Jerseys. The illustration in the August number of the *Journal* shown over the name of "Pepper" is a picture of Mr. Dermer's Frisk. An illustration of Pepper is shown in this issue.



C. G. C. Dermer's Young Sybil (Jersey).

Best Jersey in mature class to date. Yield: 11,738·5 lb. of milk, 565·42 lb. of fat, in 365 days. Age at start of test: 10 years 285 days.

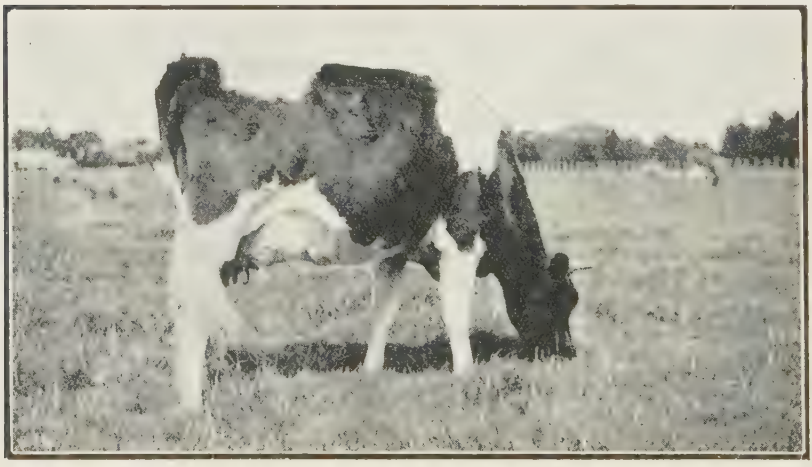


A. E. Wilkinson's Pepper (Jersey).

The leader in the three-year-old Jersey class. Yield: 9,288·4 lb. of milk, 546·01 lb. of fat, in 365 days. Age at start of test: 3 years 195 days.

J. Deacon's Butter-girl (Holstein).

The best heifer in the two-year-old Holstein class to date. Yield: 12,344 lb. of milk, 511·35 lb. of fat, in 321 days. Age at start of test: 2 years 307 days.



A. J. Gallichan's Diamond (Holstein).

Head of the four-year-old Holstein class. Yield: 15,323·45 lb. of milk, 440·254 lb. of fat, in 336 days. Age at start of test: 4 years 99 days. She dropped her subsequent calf within the year.

For the first time the Ayrshire breed is represented in these lists. The Ayrshires did not take up the testing-work until a year after the other two breeds, and we hope to be able to publish more records of Ayrshire cows in subsequent issues.

Name of Cow.	Name and Address of Owner.	Age at starting Test.	Fat req'd. Cert.	Yield for Season.		
				Days.	Milk.	Fat.
	AYRSHIRES.					
Two-year-old Class.		Y. dys.	lb.		lb.	lb.
Dominion Fenwick Cherry	Moumahaki Exp. Farm	2 112	251·7	260	6642·50	260·66
Dominion Parkhead Dewdrop	,,	2 298	270·3	260	8403·50	287·82
Three-year-old Class.						
Dominion Dalmunsernock White Blair IV	Moumahaki Exp. Farm	3 214	298·4	292	8104·20	323·72
Four-year-old Class.						
Dark Stately ..	C. E. C. Webb, Koputaroa	4 255	339·0	344	9268·50	354·29
	HOLSTEINS.					
Two-year-old Class.						
Butter-girl ..	J. Deacon, Manaia ..	2 307	271·2	321	12344·40	511·35
Dominion Roma ..	Weraroa Exp. Farm ..	2 325	273·0	306	10672·35	330·98
Dominion Freesia ..	,, ..	2 201	260·6	329	8358·55	297·53
Three-year-old Class.						
Johanna Beauty Belle Piebe	A. J. Gallichan, Tiakitahuna	3 321	309·1	262	14420·20	461·39
Four-year-old Class.						
Diamond	A. J. Gallichan, Tiakitahuna	4 99	323·4	336	15323·45	440·25
Mature Class.						
Lassie II	J. Imlah, Kaupokonui	5 113	350·0	293	9773·00	353·02
	JERSEYS.					
Two-year-old Class						
Heather's Darling III*	P. J. Petersen, Midhirst	2 253	265·8	364	5911·90	393·99
Campanile's Lady ..	Messrs. Clague Bros., Manaia	2 314	271·9	363	7477·60	356·42
Three-year-old Class.						
New Year's Gift ..	D. E. Scott, Hawera..	3 172	294·2	360	7675·70	490·26
Mature Class.						
Young Sybil ..	C. G. C. Dermer, Cheltenham	10 285	350·0	365	11738·50	565·42
Thistle VI ..	R. J. Linn, Normanby	8 259	350·0	333	10891·50	542·55
Little Violet ..	,, ,,	5 285	350·0	315	9137·90	456·89
Viscount's Myrtle ..	C. G. C. Dermer, Cheltenham	5 163	350·0	331	7718·00	424·31
Tricksey	P. J. Pettigrew, Pihama	10 345	350·0	258	7692·00	421·87

* The milk-weights for September, 1913, of this cow were lost, and she therefore received no credit for any milk or fat during that month. The days since calving, however, represent the period between her date of calving and date of drying off.

TESTING CREAM BY THE BABCOCK METHOD.

W. E. Gwillim.

The fat-content of cream can be as accurately ascertained as the fat-content of milk. Special attention must, however, be paid to the sampling of the cream. The method of testing is the same as that used for milk, but with the following modifications: (1) The test-bottle is especially designed for the purpose, and is called the "cream-test bottle"; (2) the quantity of cream required for a test must be weighed into the test-bottle; (3) some temperatures employed may be higher than those used for milk-testing; (4) the fat in the completed test is read in a manner slightly different from the way in which the fat of a milk-sample is read.

Cream must be mixed before Sampling.

The sample must be representative. The composition of cream varies greatly. The constituents become unevenly distributed when cream is allowed to stand undisturbed, and the general condition will also vary as the cream ages and ripens and changes in temperature. The fat-content of cream ranges from below 25 per cent. to over 60 per cent. The variations may be due to or be influenced by the process of creaming, the temperatures employed, and the quality and composition of the milk skimmed. It is not essential that cream should be in a fresh and sweet condition to ensure correct sampling. Supplies for testing, especially at dairy factories receiving farm-separated cream, are, as often as not, in a more or less soured condition.

To obtain a True Sample of Cream.

Before any sampling is attempted the cream should be thoroughly mixed to bring it to an even consistency. A thorough mixing can be effected by agitating with a special kind of stirrer and afterwards by pouring the cream from the vessel containing it into another. The sample may then be taken by dipping out about 1 oz. with a small cup or dipper. There is no method of sampling better than this. Should a proportionate sample be required, 1 c.c. may be taken for every 10 lb. of cream. A sample of cream for a single testing should consist of not less than 1 oz. or about 30 c.c. When cream is very thick and cold and cannot be stirred it should be warmed until it will pour readily and then be mixed. The cream-stirrer is of tinned steel, and consists of a rod fitted at the end with a perforated disc. When being used it should be plunged into and worked through the cream, so that all is agitated. A thorough agitation with this stirrer may suffice for a complete mixing of fresh sweet cream. A stick is of no use as a stirrer for thoroughly mixing cream.

Preserving Cream-samples.

The preservatives recommended for milk-samples may be used for cream. Samples must be kept in well-closed bottles. Loss of moisture by evaporation can be considerable when samples are left uncovered. Samples should be kept in a cool place. At dairy factories samples should be kept in the refrigerator.

The Cream-test Bottle.

The pattern of the cream-test bottle is similar to the test-bottle for milk, but the neck is wider. Some bottles are graduated to 30 per cent. in ½-per-cent. divisions, and others to 50 per cent. in 1-per-cent. divisions.

The Cream-sample for testing must be weighed.

The weight of cream required for a test is the same as that used for a milk-test—namely, 18 grams. In milk-testing, the volume taken is equivalent to 18 grams, but with cream a given volume cannot be relied upon to correspond with a definite weight, because the specific gravity of cream is so variable. The proportion of fat to the other substances varies more in cream than in milk, and a good average of the specific gravity cannot be established. The specific gravity is also varied (1) in separator cream by more or less air incorporated during separation ; and (2) in ripened cream, by the presence of gases developed during ripening. For these reasons the quantity taken for a test must be weighed into the test-bottle.

Scales for weighing Cream-samples.

A delicately balanced scale is required for weighing cream. A 100-gram chemist's beam balance is suitable where only a few samples are to be tested. For a greater number a specially designed cream-test scale, as illustrated, to weigh up to twelve samples, is more convenient.

The Weight of Cream required.

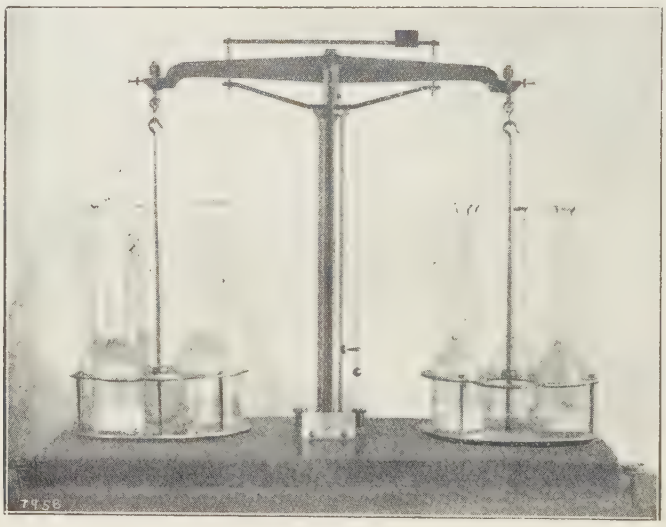
Although 18 grams of cream are required for a test to conform with the spacing of the graduations on the test-bottle, it is usual to use only 9 grams and to double the reading of the percentage of fat shown in the completed test. When 18 grams are used the fat may fill a space greater than the graduated part of the neck of the bottle, and any reading outside of the graduations may be inexact. When 9 grams of cream are used approximately 9 c.c. of water are added. The addition of the water has a beneficial influence on the sulphuric acid. The acid is less likely to char the fat than when 18 grams of cream are used. A pipette is convenient for placing cream-samples into test-bottles. If this is not available a sharp-lipped spoon may be used.

How to operate the Test.

The procedure for operating the test is practically the same as for testing milk. The cream should be even and uniform before weighing. It should be warmed to 85° F. and stirred with a small hair brush, and further mixed by being poured twice from vessel to vessel. The same quantity of sulphuric acid is used as for milk, whether 9 or 18 grams of cream is used. The temperature of the water added during machining may range to 200° F. After machining is completed the bottles are removed to a bath of water at 140° F.

Reading the Percentage of Fat.

The reading of the fat in the completed test is a very important factor in cream-testing. In testing milk the test-bottle has a narrower neck, and is graduated to 0·2 per cent. The fat is read to the top of the meniscus on the fat-column to allow for the small amount of residual fat in the base of the bottle. This cannot be done in the case of cream, as the meniscus is wider and may cover a space equal to 1 per cent. or more. The reading of the fat-column with the meniscus is unreliable, and to obviate error the meniscus should be flattened or levelled. This may be done (1) by oil of a specific gravity lower than that of butter-fat, or (2) by alcohol which has absorbed all the fat it will take up. The oil used is a petroleum distillate commonly known as "liquid paraffin," or as "No. 1 white mineral oil." It is almost water-white, and can be used as it is or be coloured red by means of alkanet-root. About 1 oz. of the root crushed and tied in a piece of butter-muslin and added to a quart of the oil and allowed to stand for a day or two will dye the oil a bright-red colour.



The Cream Scale.

Fatted alcohol may be made by melting about a teaspoonful of butter-fat and placing this in a bottle with about 6 oz. of alcohol (clear methylated spirits will do). Mix by shaking. Allow the un-absorbed fat to settle and the mixture is ready for use.

A pipette, oil-can, or burette with pinch-cock should be used when handling these substances. When the test-bottles are removed to the water-bath, add to each a small quantity of either the oil or alcohol by allowing it to flow gently down the neck of the bottle on to the fat. About 0·5 c.c., or as much as will fill a space about $\frac{3}{8}$ in. above the fat, is sufficient. The meniscus disappears at once, and the surface becomes level. The column of fat should then be read from the bottom to the top. Where no means for levelling the meniscus

are available read the fat from the bottom of the column up to what appears to be the lowest part of the meniscus.

ILLUSTRATION OF MENISCUS.

In the illustration of cream-test bottles, 1 and 2 serve to indicate how the reading of the fat can be influenced by the meniscus. Bottle 1 shows the fat as it appears after the final whirling in the centrifuge, and the letters A, B, C, are at points at which the fat might be read. Bottle 2 shows the meniscus levelled. The letter C indicates the true level of the fat, and letter D denotes the substance used for levelling.

CONDITION OF FAT-COLUMN OF CREAM TESTS.

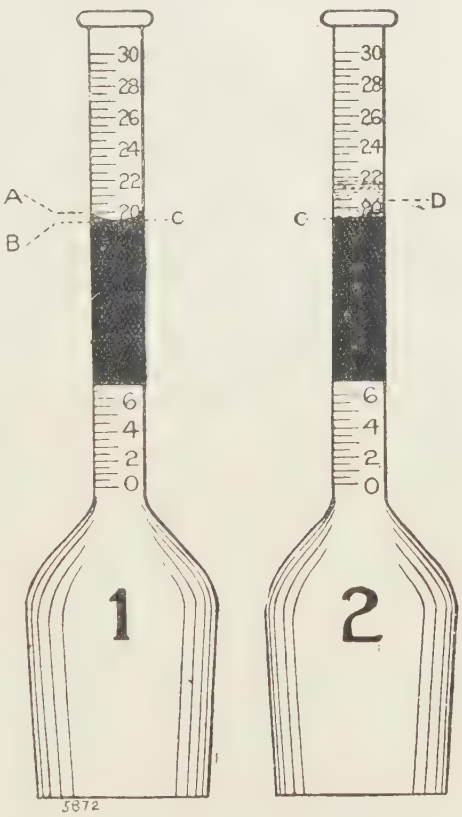
The fat-column of cream tests should be in a clear, fluid state, and should be hot. Fats which are pale, milky, dirty, or cold, or which appear solid and congealed, should be discarded.

ACCURACY OF THE BABCOCK METHOD.

The testing of cream by the method herein described gives results as accurate as those obtained by gravimetric chemical analysis.

COMPOSITE SAMPLES OF CREAM.

The work of testing cream, although simple, is a delicate operation, and requires care, attention, and time. Users of this test as a rule try to reduce the necessary work to the minimum. Particularly is this so in connection with regular supplies of milk and the system of composite samples for testing obtains. As far as can be ascertained, the same system can be applied to regular deliveries of cream. Data regarding the comparative results obtained by single and composite samples continue to collect. They generally demonstrate that composite samples of regular deliveries of cream extending over a period of a week to ten days give as accurate results as single testings. Accuracy in results is all that is wanted in testing. Errors may be as likely to tell against the supplier as the receiver of cream, therefore where both parties are agreeable to the testing of composite samples this system should be used. At the same time either party should reserve the right to have recourse to single testings at will.



READING FAT OF CREAM-TESTS.

WORK FOR THE COMING MONTH.

NEW ZEALAND is a country of wide variation in climatic and soil conditions. In applying suggested procedure it is, therefore, necessary for the farmer to amend it to suit local weather-conditions and the requirements of his soil—information which can best be ascertained by a study of these problems on the part of the farmer himself. Nothing can take the place of local knowledge. Little advice on an agricultural subject is capable of general application in its entirety.

THE FARM.

Primrose McConnell.

In many parts of the North Island successful crops of cereals are occasionally grown when sown as late as October, but for the best results this may be accepted as too late. Nevertheless, those who are desirous of responding to the call of patriotism should not hesitate to sow wheat if they have not already done so, the circumstances being so very exceptional. For the North Island, Bobs and White Straw Tuscan are among the best varieties. When sowing so late the seeding should be heavier than for early sowing, because the plants do not stool out so well. The cultivation should be deep and thorough (deeper than for other cereals), because wheat is of a deeper-rooting habit.

Rye may still be sown, either for the grain, or for cutting green to be used as thatch.

Land intended for mangels should receive its second ploughing, if this is not already done. It is wise to have the whole cultivation-work finished by the middle of the month, which is a good time to sow. When sown in rows, about 27 in. apart, with the intention of afterwards singling out the plants by hand, 6 lb. of seed per acre should be used. The distance apart to which the plants should be thinned is a matter of opinion, but it is generally accepted that a large number of medium-sized roots is better than a few abnormally large. In comparison the latter are of low feeding-value, and do not keep so well when stored. Generally speaking, 10 in. to 12 in. may be accepted as a suitable distance between the plants. The careful thinner, however, will not hesitate to go to 15 in., or even more, if by doing so he can leave two extra strong healthy plants in preference to two weakly ones. Indeed, the coming yield per acre is greatly influenced by the man with the hand-hoe. As to varieties, the Long Red is still one of the best, if the soil be deep and good, although it is more troublesome in storing than the Globe or Tankard varieties. The two latter, however, succeed better than the former on soils of a shallow nature. The mangel is a gross feeder, and should be liberally manured—say, 3½ cwt. basic superphosphate and 1½ cwt. of bonedust per acre. On many soils potash may be added with very good results, but this is a matter which the individual farmer may determine better than any one else

by a few simple experiments. When the land contains a sufficiency of lime a little gypsum may be also added. It is true that gypsum has a tendency to increase the acidity of soils, but the mangel is not so susceptible to the influence of acids as the swede or turnip.

Some of the quick-growing varieties of turnips may be sown now. They yield an excellent crop by January, followed by another crop, such as crimson clover, or barley and tares, the latter being fit for feeding off in April. Among the best varieties for this purpose are Red Paragon and Purple-top Mammoth.

Old mangel-clamps which may be still in reserve should be stripped of their covering, as the increasing heat of the weather causes excessive growth, which reduces the feeding-value of the bulbs. Even although the mangels look shrivelled they have lost nothing except water.

If the land is in good condition and free from weeds lucerne may be sown towards the end of the month. In order to secure success in lucerne-growing the main essentials are—good drainage, lime, good seed, inoculation, and liberal manuring when the land is poor. Good, deep preparatory cultivation is also necessary. When it is intended to sow the seeds broadcast the cultivation-work should be finished with the Cambridge roller, the rings of which leave a solid, even bed for the seed, which may be covered in with the brush harrow. Even when the seed is drilled rolling is essential, otherwise it may be too deeply buried. It is admitted that some soils will grow good lucerne without inoculation, but, on the other hand, the majority of failures are the result of its omission. The cost of applying the soil is so small that it seems foolish to neglect it when by doing so we court failure. The quantity of soil used should not be less than 2 cwt. per acre, and it is best applied just before sowing the seed. It should be immediately harrowed in. Fifteen pounds of seed per acre is ample, and if the land has been well limed the manures may consist of a mixture of 3 cwt. of basic superphosphate and 2 cwt. of bonedust per acre. Towards the end of the month the first growth on established paddocks will be fit for cutting, and for the reason that haymaking is very risky at this time of year the crop may be either used for soiling or made into ensilage. If the latter, it is well to mix it with pasture grass or some other non-legume.

Main crops of rape and kale may now be sown, and in localities not subject to late frosts the first sowing of maize may be made. As manure for rape and kale, basic superphosphate may be used with every confidence, and for maize, which requires very liberal treatment, a mixture of 3 cwt. of basic superphosphate, 1 cwt. of Seychelles guano, and 1 cwt. bonedust per acre. On light land add 30 lb. of sulphate of potash.

The writer is of the opinion that when labour-saving implements are brought to greater perfection ensilage made from maize will come more into use, particularly on dairy farms, but for the most economical results silos with all their accessories are necessary. Maize ensilage and lucerne hay, fed in conjunction, is a dairy-cow food that is difficult to surpass—it is all a question of cost.

The main crop of potatoes may now be planted, except on low, swampy ground, where late frosts are common. The farmer who has carefully selected his seed tubers and has put them to sprout in shallow

boxes during winter may reasonably expect to be handsomely compensated for his trouble.

Dairy operations will now be at their height, and in order to make the best use of the surplus milk it is wise to have several sows due to farrow about this time. Better results would be had if more pigs were kept, less milk per pig used, and a very little meal added to make up for the smaller ration of milk. Of course, I am referring to a normal season. War prices for all cereals will undoubtedly obtain for some time.

There is also great room for improvement in the quality of the pigs generally kept. The indifferent type is merely a scavenger for cleaning up odds and ends. As a rent-payer he is a failure. It is not, however, altogether a matter of breed. There are good and bad types in all breeds.

In comparatively small ewe flocks the lambs should be docked when they are about a fortnight old. The writer prefers the knife to the searing-iron. It is advisable to draft the lambs into a pen by themselves, and allow them to settle down for an hour or two after the excitement of driving and penning, before commencing operations. A temporary yard in a clean paddock is the best place.

Many inquiries have lately come to hand as to the system of calf-feeding at the Ruakura Farm of Instruction. It is as follows: First four weeks, new milk (for special stud calves it may be continued longer). Fresh separated milk is then gradually introduced, until at the end of six weeks the new milk is eliminated. When the separated milk is commenced a teaspoonful of pure raw crushed linseed is added, and this is gradually increased as the new milk is decreased until the maximum of one tablespoonful is reached. The crushed linseed is simply stirred into the milk without any preparation whatever. After the calves are two days old a pinch of carbonate of soda is stirred into the milk at each meal, and as soon as they commence to chew the cud a handful of crushed oats is placed in a convenient trough, also a little sweet hay. The crushed oats are gradually increased, until a maximum of about a quarter of a pound is reached. The calves have free access to clean drinking-water and rock salt. Pails are kept clean, and the pens regularly whitewashed. Under the above conditions not a single case of scour occurred last season. For the ordinary dairy calf three weeks new milk will suffice, but the introduction to the separated should be gradual. The calves at this station are fed twice a day only, and the average daily quantity of new milk supplied to each calf is a little over a gallon. The colostrum, or first milk, is always given to the calf.

THE ORCHARD.

W. A. Boucher.

Fungus Diseases.

Spraying for the control of fungus diseases attacking peaches and nectarines should have been carried out when the buds commenced to swell. The question is frequently asked whether it is wise to spray these fruits with the Bordeaux mixture when the trees are in foliage.

There can be only one answer, which is that the result of such a spraying would probably be seriously injurious to the trees. The foliage of the peach and nectarine is extremely susceptible to spray injury; consequently the application of spraying-compounds to these fruits should as far as possible be confined to autumn and early spring.

Apple-scab (*Fusicladium dendriticum*) and pear-scab (*Fusicladium pyrinum*) usually become increasingly troublesome as spring verges into summer. In the last issue of this *Journal* growers were advised to use the Bordeaux mixture at the winter strength just after the buds had commenced to swell, in order to minimize as far as possible attack by these fungus diseases later in the season. In any case, however, one or two later sprayings will probably be required, much, of course, depending upon the climatic conditions of locality and season. Should later applications be required, the Bordeaux mixture, 4-5-50 strength, is recommended. This may be used in combination with arsenate of lead, although some growers now prefer not to add the arsenate of lead to the Bordeaux mixture, as they consider that the combination of the spraying-compounds sets up a caustic action which has an injurious effect upon the foliage of some varieties of apples.

Codlin-moth.

By most commercial orchardists codlin-moth is no longer regarded as a really troublesome pest. It is now generally well recognized that by using a really good brand of arsenate of lead moth-infection can be reduced to a minimum. It may be as well to emphasize the necessity of selecting a brand of arsenate of lead of standard quality. Attention has previously been drawn to the fact that the cost of spraying lies principally in the labour employed, and that it is altogether false economy to purchase spraying-compounds that are cheap but not effective.

Woolly Aphis.

Winter spraying with red oil has proved decidedly effective in reducing the ravages of this troublesome pest. However, in spite of the most careful and thorough winter spraying, colonies of aphis will appear later in the season. A careful watch should be kept for the reappearance of any such later infection. Painting infected portions of trees with the red oil emulsified, but undiluted, will be found to be effective.

THE VINEHOUSE AND VINEYARD.

S. F. Anderson.

The Vinehouse.

Regular subscribers will be able to turn up the notes on the work in the vinehouse for this month in the September number of last year.

To those notes will be added the recommendation to take advantage, where possible, of the very vigorous growth made during this and the following month to restore the vigour of the vines. It has been pointed out in former notes how, by an excessive summer pruning year after

year, the power of the vines to produce strong wood and large bunches has been seriously impaired. Now is the time to restore, in some measure, the necessary vigour by leaving as much foliage as possible. Where vines have been planted too close, and the fruit-bearing shoots put forth by them are getting spindly and weak, cut out a vine or two to make room for putting the rods farther apart, so that the foliage can be increased. It has been described and illustrated in the *Journal* for December of last year how, where the space is limited, this increase may be made by leaving a leaf or two more on the sublaterals.

To continue the management of the fruit-bearing shoots from last month's notes: These will be now, or will be before the end of the month, long enough to have their first stopping. This is done two leaves beyond the young bunch. If space will allow, three leaves may be left. In the case of vines putting out weak shoots, mentioned above, as many leaves as possible without overcrowding may be left. In a week or two the shoots that have been stopped will start again, and after making four to six leaves should be stopped to another two leaves, making four beyond the fruit. Stopping the shoots in this way causes the sublaterals to push out. The number of leaves to be left on these may depend on the space between rod and rod. If space is small, then leave two or three, but where ample, then only one leaf. They should never be broken clean out. In regulating the amount of foliage the main principle of health, vigour, and fine fruit should never be overlooked, and this can only be obtained by a right balance of leaf surface with the fruit on the vine. (See page 23 of Bulletin No. 40.)

The sulphuring of the vines must not be omitted. Mildew may make its appearance any time. Various ways of applying sulphur have been given in this *Journal*. In the cool vinehouse, dusting it on the leaves by the bellows has been the most approved method in the past. Hanging it about in muslin bags and in shallow vessels is of very little use. It may be necessary to remind inexperienced growers that in no case should it be burned. A method of sulphuring recommended by Mr. W. H. Taylor, Manager of the Arataki Experimental Farm, is to apply the sulphur in liquid form. How this is done is thus described by Mr. Taylor: "A handful of sulphur is thrown into a kerosene-tin, and is then mixed with a little milk of just sufficient quantity to make a stiff paste, care being taken to remove all lumps. Of course, the milk should not be sour. Then fill the tin with tepid water, taking care that it is not too warm, as it would then have the effect of curdling the milk. Spray this in the usual way."

No attempt should be made to tie the fruiting-shoots in position until they attain a certain toughness. Keep the borders well hoed, both inside and out.

The Vineyard.

Outdoor table-grape vines will now require close attention. In the case of American varieties the gradual spreading horizontal growth may require further support, and a little judicious pinching may be done to control the growth. Keep the soil under them well hoed as weather permits. A clean surface reflects the heat. Earlier and sweeter fruit will be obtained from vines worked under such conditions. This is more effective if done before the flower-buds open, which is about November.

The Black Hamburg, Golden Chasselas, and other European varieties of table-grapes grown on the espalier fence will not require much attention this month, beyond some disbudding, sulphuring, and possibly tying up a few of the strongest shoots. The fruiting-shoots growing up from the horizontal rod should not be stopped or pinched till they reach the top wire. In northern districts Bordeaux mixture must be applied, no matter how free the vines may appear to be from black-spot. Sulphur may be applied any time. This does not interfere with the setting of the fruit, but spraying with the Bordeaux mixture should be done before and after the flowers have set their fruit. The same remarks apply to wine-grape vines.

THE POULTRY-YARD.

F. C. Brown.

The Close of the Hatching Season.

October should see the termination of all hatching operations, though a breed like the White Leghorn, under the most favourable conditions, may be hatched out even up to the first week in November. I have seen really good stock reared from chickens which were not taken from the incubator till the second week in November, but the circumstances under which they were reared were quite exceptional. The owner was so ashamed of the appearance of these late chickens that he put them as far back on the plant as he could, but unconsciously thus provided them with just the conditions they required to counteract the lateness of their hatching. He placed them in a run which had been well rested and which was fresh and clean, and which enjoyed the further advantage of being well shaded. In a couple of months' time, aided by good feeding and attention, they were among the best-looking stock on the place. The lesson is obvious. The late-hatched chick, under ordinary circumstances, is placed in stale quarters and runs, and has not the protection from hot weather which nature demands, but which chickens hatched at a cooler period do not require. Provide clean quarters and runs (vermin are at their worst in hot weather), shade, abundant green food and clean cold water, and the late-hatched birds may develop into profitable stock. There is an advantage with late-hatched stock if these are reared satisfactorily, as there is not the same risk of these going into a moult as there is with stock hatched at the more approved time. Summed up, late-hatched stock are generally unsatisfactory, because they do not enjoy the same desirable conditions for development (which can be artificially provided) as do stock hatched when the weather is more favourable to healthy development.

It may be well to again emphasize the great importance of thoroughly clean quarters and clean runs. I have repeatedly seen White Leghorn stock come to maturity at five months old where every detail of the accommodation was sweet and clean, whereas birds from the same stock did not attain the same degree of development till they were seven months old, although reared on more up-to-date plants; but these late-comers had to follow the earlier-hatched stock, and had

therefore to roost in stale quarters and tainted runs. The poultryman may well take a lesson from the sheep or cattle farmer. These men are being taught by bitter experience to realize that if they are to avoid disease and secure rapid and satisfactory maturity in their stock they must provide absolutely clean quarters and paddocks at lambing and calving times, and must have smaller paddocks, so that their stock may have frequent changes on clean and fresh pastures. I have always favoured the alternate run to a poultry-house, and the more experience I have of utility-poultry keeping the more I realize the importance of it. On all plants an endeavour should be made to turn over the soil and sow down fresh grass in a certain number of runs each year, allowing the worked-up soil to be exposed to the influence of the atmosphere for several months, and liming it well before seeding. Especially is this necessary where the soil is of a heavy nature. Runs attached to brooders—in fact, all land on which chickens are run—should be thus treated every season.

Fighting Vermin and Disease.

Many poultrymen are lured into a false sense of security because, having new houses and runs, they go on for several seasons with their stock in a healthy condition ; but becoming a little careless, and failing to keep the quarters as clean as they should be and the runs fresh and sweet, they are suddenly confronted with some infectious disease. A drastic cure becomes imperative, whilst stringent means must be taken to prevent the trouble spreading. Obviously the preventive measures should have been in force right from the establishment of the plant. To thoroughly clean out vermin and to destroy the germs of disease, which may lurk in crevices and cracks and thus cause a recurring attack on the stock, it is desirable that all hiding-places for insect-life be eliminated. The best means of doing this is to coat the whole interior of the houses, as well as the fittings, with tar (in which a little bitumen may be mixed to harden it), so that when the spraying with a disinfectant takes place this may be thoroughly effective. In the great majority of houses, even where lime-washed, spraying against insect-life is invariably not as effective as it should be, as the spraying-material does not reach down the crevices and cracks, where the insects swarm most thickly. In the case of disease it would require a microscope to locate the dangerous germs, and even then they would be probably hard to discover. The house well coated with tar can be disinfected and disease germs destroyed, but it is seldom the ordinary fowlhouse interior can be dealt with with any measure of success. The run is also a great source of danger, for the germs of disease may survive in the soil for a considerable time. If, therefore, disease appears the soil should be turned over, well limed, and sown down with a thick seeding of grass. The first thing to do on the appearance of disease is to promptly isolate affected birds, and if the bird is badly affected it should be at once destroyed and the body burnt.

The Developing Stock.

Altogether too little consideration is given to the housing, feeding, and management of the young stock after they have been turned out of the brooder. Few plants, indeed, have any special quarters prepared

for them; and just when the chickens demand every favouring condition, if they are to develop to the best advantage, they are turned into old quarters or some unsatisfactory building, with no proper provision for cooling off, because all the good houses are occupied by adult stock. Obviously, proper provision should be made in thoroughly clean houses and runs for the young stock, and some hover arrangement should be provided, so that they will not huddle, as they invariably do if taken direct from a brooder to an open-fronted house where no special sleeping-quarters are provided; and huddling, with the sweating thereby induced, is a common cause of chill and inevitable mortality. A simple sleeping arrangement is a framework of 8 in. boards, with a light frame covered with open scrim to drop just inside the open top, an opening being made at one side for the chickens to enter or leave it. There is, of course, no bottom to the frame, but the earth where it stands must be dry and be covered well with chaff, sawdust, pine-needles, or other suitable material. A frame 4 ft. square should be sufficient for 100 chicks. After about a week the scrim frame can be removed. It should not be forgotten that the chicks should receive modified hardening-off treatment before they are removed from the brooder, by gradually reducing the heat (where this is possible), or removing them farther from the source of heat where this cannot be interfered with. Care is specially necessary in providing some protection after the brooder stage where the brooding-capacity is limited and the chicks are deprived of the artificial heat before they should be. In these circumstances a light piece of flannel may be laid on the scrim frame for the first few days, leaving sufficient space at the sides for ventilation. Chicks at this age require a good run on absolutely sweet ground, and must be well protected from adverse weather. There is no better place for them than the orchard. Above all things, they require good green stuff, grit, and clean water. Crushed, sound, plump oats may with advantage be their main diet. Beware of poor-quality oats, which very largely consist of husks, which are of no food value. Considering the present price of wheat, boiled barley may be occasionally used as a substitute for the oats in place of wheat. Barley-meal, crushed peas, &c., may be mixed with the morning mash, while vegetables, lucerne, &c., may be added to it with advantage, and so lower the feeding-cost. Range is essential to healthy development, especially for the coming layers and cockerels it is intended to breed from. Confinement is necessary in fattening, but it is most undesirable for vigorous and healthy growth, having a tendency to overforce the birds and bring on leg and other weaknesses.

Ducks.

Many farmers, especially those who have orchards, would find the keeping of a small flock of ducks a most profitable investment. Such breeds as Pekins or Buff Orpingtons are not only good layers—some strains are really heavy egg-producers—but their carcases are valuable for the table. Hatched out in September, the young drakes can be made one of the most valuable forms of table-poultry that can be marketed during the Christmas season. In the first weeks of last December prime ducks in the feather were worth from 11d. to 1s. a pound; and as three-months-old Pekins and Buff Orpingtons, pro-

perly fed, should weigh from 4 lb. to 5 lb., the return is seen to be highly satisfactory. A decided advantage in the female ducks kept as laying-stock is that they require very little attention, especially where they have good shelter. They can be confined in the early part of the day, and then be allowed a fairly good range. In an orchard ducks will forage for part of their food, and the orchard will be benefited.

THINGS TO REMEMBER.

To obtain good fertility and vigorous chicks the breeders must have ample exercise.

The provision of green food for the chickens is a matter of the first importance.

When chickens die they should be opened, and an endeavour made to discover the possible cause of death.

It will pay to feed early-hatched cockerels well, and market these when they are about four months and a half old.

There is no better means of succeeding at artificial hatching and rearing than studying the methods of the mother hen.

If disease is discovered among the fowls, promptly isolate all birds showing the least sign of being unwell.

Chill, overcrowding, and dirty quarters are common causes of mortality among chickens.

Make the chicken-coop cat and rat proof. It will probably save annoyance and loss later on.

Although the cost of foodstuffs is high, it is a penny-wise-and-pound-foolish policy to stint the heavy-laying hen. A much better way to economize is to cull out the poor layer.

THE APIARY.

F. A. Jacobsen.

It is most essential at this period of the year to watch the food-supply. The weather is generally of such an unsettled nature, and this often extends into October, that it is impossible for colonies to gather sufficient for normal brood-rearing. It is in the spring the bees build the foundation whereon depends the future success of the colony at harvest-time. Weak stocks should be paid particular attention to, and it would be beneficial to give these a frame of healthy brood from some of the stronger ones. There is often a shortage of flowering-plants between fruit-bloom and clover-bloom, necessitating additional watchfulness in this respect.

Food, feeding, and feeders are dealt with in a leaflet entitled "Feeding and Feeders" recently printed. Copies of this may be had free on application to the Secretary of Agriculture, Wellington. Never forget

that it is dangerous to feed to bees honey from an unknown source. It is even dangerous to feed honey from your own apiary unless you are absolutely certain it is free from the disease of foul-brood. Even if your apiary is clean, some combs may contain the germs of infection gathered from diseased colonies in the district, the presence of which would not be discernible for several weeks after introduction. Owing to the insidious nature of foul-brood, it is safer in nearly every case to feed with cane-sugar made into a syrup. To stimulate brood-rearing in the spring about one-third sugar to two-thirds water should be used, but for wintering purposes as much sugar as warm water will dissolve—perhaps two parts of sugar to one of water—is preferable.

The best cane-sugar should be used for making syrup in the spring, not beet-sugar. That known in the Dominion as No. 2 crystals is suitable. For each 2 lb. of sugar add 1 pint of water. Place on a fire and stir until brought to the boil; then remove until cool, when it can be used. Take care not to spoil by burning.

Close attention must be paid from now until the autumn to the hatching of the brood. Any symptoms indicating the non-development of the larvæ should be examined closely, and the cause discovered. Possibly 90 per cent. of failures in this connection can be traced to the ravages of foul-brood. Briefly, foul-brood may be detected as follows: Remove the caps of any suspicious cells, and insert a wooden toothpick, or something similar, to the bottom; withdraw the toothpick slowly, and should a thread of decayed matter, brownish in colour, adhere to the pick the colony has the worst disease known in bee-culture. In the evening remove all the brood, honey, and combs, and in their place put several frames containing half-inch strips of foundation comb. Leave the bees on these for four days, after which remove these in their turn, and place in the hive clean frames containing full sets of foundation comb. The starters and old combs must be destroyed to prevent risk of reinfection. Fuller details are given in a leaflet supplied free on application.

Care must be taken that robbing does not commence, especially if there are any symptoms of foul-brood in the apiary, as this is a most effective way of encouraging it. Especially watch weak colonies. Should any of these be attacked, close the hives and remove them a considerable distance. Release the bees at nightfall.

THE GARDEN.

W. H. Taylor.

Vegetable-culture.

The best time to sow or plant in every part of the Dominion is naturally not the same, nor do I imagine that any one man knows it. Many things that appear quite simple to a person with but a superficial knowledge are in reality quite impossible. Even in the same district local conditions vary so much as to make it necessary to vary operations

to meet the difference. Thus in articles of this kind one is able to generalize only. Much must of necessity be left to the exercise of judgment, schooled by experience. In some places there is a quite phenomenal rapidity of growth at certain times, and plants put out much later than in other parts overtake them in ultimate development. There are also places that are quite out of the range of these articles, such as certain situations where very early peas are produced and where nothing can be grown later, because the soil becomes too dry. With such places I have nothing to do. I deal only with average conditions, and these vary enough. My effort is to lay down safe lines, which, though they may be departed from in some instances and to some extent, are nevertheless reliable, and are from individual experience gained in many years of practical work. As instances of what I mean by local conditions affecting the time for planting or sowing: In the Manawatu are many varieties of soil. About Otaki and Paraparaumu the soil is a black sandy loam, very warm, and never very dry or very wet. There spring is a month earlier than on the heavier lands eight miles distant. About Wellington the first week in July is the time to sow onions; on the heavy, flat lands just mentioned the soil is not fit for onions till nearly two months later. About Levin and Weraroa there are tracts of stony soil where sowing and planting is rightly done several weeks in advance of the same operations on heavy land in the same neighbourhood. I mention these things to show readers that it is impossible to advise as to exact dates. My advice must be supplemented by their own knowledge of local conditions. Just as the starting of a crop is affected by the time that real spring weather commences in different places, so also the same conditions rule to a very great extent the duration of the crop. I am asked by a correspondent in the South Island to say what cabbage and savoy should be grown to come in to use in September and October, and when to sow. The fact that I cannot give the information is largely because of the conditions referred to, and partly because it must be almost a matter of chance getting either in those months. Savoys are a winter crop, and not worth having at any other time. The further into spring the plants will stand the more useful they are, but it must be distinctly understood that it would be useless to sow or plant for the purpose of getting them in September or October. The natural habit is to bolt to seed in spring, spring being at different times, as said above. In most places they bolt early in September, some places in August, rarely a little later. In the Manawatu I have cut some as late as the end of October, but it was only by chance. It would be useless to plant very late hoping to get them later, because they would make no growth during winter, and would bolt in spring just the same, however small they might be. The middle of November is as late as sowing can be left. The plants must be out during January or there will be no growth. I think one variety of savoy as good as another. Cabbages are ruled by the same law up to the point where the winter crop stops. These may remain fit for use late, they may not; but these are an all-the-year-round vegetable, therefore there is a spring crop. Seed is put in at the very end of March or the first week in April. Plants from this sowing are to be put out as soon as they are large enough. It may be in June, or not till September.

Both happenings are in my experience. If they are ready in June, then you may expect to begin to cut in October, not before. The only places that will get them in September must be under abnormal conditions. It will be asked, why not sow earlier? The reason is very simple, because if the seed were sown earlier the plants would bolt to seed in spring instead of hearting. The same correspondent wishes to know what cauliflower and broccoli to sow, and when to sow to come in from May until November. Cauliflowers are not a winter crop. Sow any large kind about mid-September and they will be in use at Easter-time, being usually over before June. Broccoli are the so-called cauliflowers, and are in use from June onward till spring cauliflowers come in. Cauliflower-seed is sown in Autumn, when cabbage is sown, and planted when ready. Early types—Early London, Early Snowball, and suchlike—they are all the same—should be in use early in November. Broccoli may be sown from mid-September on for about eight weeks, and will come into use from May on to December, according to varieties. It is best to select several sorts from any seed catalogue, choosing early, mid-season, and late varieties. There is no certainty of any of them coming to character—there are so many influences of soil and weather at work; but I always have found that by growing a number of sorts they carry over the time between them, although the so-called late—even from the best possible source—will sometimes be early; but mid-season may also be late, so all's well that ends well.

Current work at this time will include sowing peas, turnip, carrot, parsnip for early use, and leeks, lettuce, radish, French beans—these latter not before the 1st October, except in the warmer parts of the extreme North. Cauliflower should be sown of the Autumn Giant variety. Celery may be sown in the open ground.

Leek seed should be sown in drills. They are to be transplanted. It is often advised that the seed should be thinly sown, so that the young plants grow up sturdy and do not become drawn. For my own part, I prefer to follow opposite lines. I like to sow thickly so as to draw them up, and short, stocky plants on the outside of the row I discard. The reason for this will wait for future telling.

French beans are in two main classes—green-podded kinds, and butter-beans, which are yellow-podded. The latter are the more delicate-flavoured, and are decidedly the best. They are, however, less hardy than the former, and I am informed that in some parts of the South Island they do not succeed. I am a little surprised at this, but it is worth a caution not to rely solely on them before trial.

Parsnips should not be wanted in the home garden before winter. When catering for private families my aim was to make the most of every kind of vegetable during its proper season, and to avoid having any one thing in use long enough for the folk to get tired of it. Economical gardening does not admit of a crop occupying the ground longer than is necessary, and the home garden is usually so limited in space that a crop that is in too long will make it impossible to grow some other.

Early in November is soon enough to sow carrot, parsnip, and red beet for winter use, and by delaying the sowing till then it gives a chance for ground now occupied to become vacant—in fact, that is

the thing a careful man works for. If parsnips are really wanted early sow a small patch, and the same with carrots. Red beet is, however, quite as much a summer as a winter vegetable. For summer use sow a small patch of turnip-rooted beet. They come to a fit state for use in a much shorter time than the long kinds, which are the best for winter use.

Celery seed may be sown in the open ground in rich soil. It would be useless to sow in poor soil, for the plants are very gross feeders at all stages. Do not sow the seed too thickly, because the plants must attain some size before transplanting. If the weather be very dry it will be necessary to water the soil to encourage germination and after-growth of the young plants. Celery will not stand stagnation of growth.

Seakale will now be starting naturally into growth, and any stools not forced will now need covering for blanching only. If the soil is very free and light the heads can be blanched by moulding up a ridge of soil above the crowns. They then grow up into the soil, and, of course, are colourless. There is some risk about it. If the weather is very wet the tender tops are likely to rot. The best plan is to cover them as though for forcing, taking care to leave no crevices for light to enter, or it will be useless. Very little light is sufficient to colour the stems.

Asparagus should be planted at once. The best time to plant is just as growth begins. The reason is very well known and not worth entering on now. The different ways of growing asparagus have been frequently described in these articles. The old way of close planting in beds is only practised now by old-fashioned people, but there are still some of them about, and they think it the best way, but always admit when pressed that they have seen no other method. Planting on the flat is much the better idea. Plants far apart give heads so superior to those from close-planted beds that no one having tried the modern way would go back to the old beds. Plant anywhere, without any further preparation than liberal manuring. Plant in rows at least 30 in. apart, and the plants the same distance apart in the rows. Open up a shallow trench wide enough to accommodate the roots when spread out flat, and about 6 in. deep or a little less. With a rake draw up soil from the bottom of the trench on each side, so as to make a ridge in the centre. Set the plants on this as on a saddle, then throw back soil to cover them. The crowns require very little covering. The roots will be deeper, and the ends of them pointing down, so that the vital parts will be deeper than might at first sight appear.

Cabbage and *cauliflower* may be planted if desired, but it will hardly be necessary if spring planting has been already done.

Any one intending to raise marrows, pumpkins, hardy cucumbers pie-melons, &c., in boxes should sow at once. I do not advise this way of raising them except for special purposes. The best plan is to sow in the open ground early in November. There is very little difference in the time of gathering produce, and a lot of labour is saved.

Tomato plants should be kept where they get plenty of light and air. Well-hardened and well-rooted plants are the only ones worth planting.

Runner-beans may be planted early in October and onward for about a month. If the soil is not very rich, or inclined to get very dry, dig a trench as for celery, dig some well-rotted manure in the bottom of it, fill three parts up with soil, and plant the beans in the trench. The most wonderful crops I have had were grown in that way.

The Flower-garden.

The garden should all be in order by now, digging all done, and grass put tidy. The edges of lawns and grass verges always spread a little on to paths and borders and require cutting back. There is a tool—edging-iron—specially designed for this work. It is a half-moon of steel, set quite straight on a straight handle, with a spade-handle top for the hold. It is far better than a spade. The edge of the grass should be cut square and straight, so as to render cutting with the edging-shears easy, because if it cuts easily it can be neatly trimmed. Trimming grass edges with sheep-shears, as is often done, is great waste of labour. Proper shears will cut as much in ten or fifteen minutes as sheep-shears will cut in two hours—that is, when one is accustomed to their use. Weedy paths are more economically treated by means of weed-killer than by hoeing, and the surface, if a close one, is not disturbed. Good paths are a comfort as well as an ornament. Loose gravel is not obtainable by every one, and is not the best, anyhow. To many a loose stony surface is very objectionable. Where binding-gravel can be obtained it is far better, if properly laid. The secret of a good road or path is first a good foundation, then a waterproof finish. The foundation should be of rough stones, not too large nor very small. Round stones should be broken, as these will not bind. The finish should be made with a crown, and the last inch or two should be fine stuff that will bind close and smooth. After a little wear—possibly only a week or two, according to the amount of traffic—there are sure to be some inequalities. As these cause hollows which hold rain, they must be filled up with fine stuff raked in, for if water lays it makes weak places that will sink further. By timely attention in filling holes a smooth surface will soon be got that will be impervious to rain, and it may be expected to remain in that condition for years, requiring no repairs so long as the smooth surface is maintained, which is why I say use weed-killer rather than cut up the road with hoe or spade. It is cheaper than labour in any case.

Chrysanthemums are best kept in a nurse-bed for a few weeks. They make but little growth at this time, and it is best to delay planting until active growth begins, because it affords opportunities of working the soil and keeping it sweet and free of weeds—much easier than can be done after planting. Beginners in chrysanthemum-culture find it difficult to believe that one small piece will make a large plant, yet such is the case, provided it be planted separately. It will, in fact, make a plant almost as large as—sometimes, indeed, even larger than—an old clump containing a score or so of such pieces, because in that case they are starved by crowding. Chrysanthemums should be planted in a sunny position. Plenty of sun and air is necessary to promote sturdy growth. In shady places they are drawn up to inconvenient heights, and are subject to bad attacks of mildew. Any one having former experience of varieties that grow too tall may dwarf

them by the simple expedient of cutting them down to about 6 in. in height at Christmas-time. They soon break again, and will grow to a fair height.

Autumn-raised plants should be got out as soon as possible. Biennials, such as Canterbury bells, various dianthus, including marguerite carnations, stocks, &c., should be set growing so that they may make good plants by flowering-time. Pansies should be planted in rich ground where it will not get very dry. A top-dressing of very old cow-manure is good to plant in, but be sure not to use it in a wet condition, because it makes the soil heavy and sticky, an exception being made where the soil is very light. In places not subject to frost hardy annuals may be sown in the open ground. It is not worth while to waste space enumerating varieties. They can be bought very cheaply, and it will be interesting to select as many from a catalogue as can be managed. There will be pleasant surprises enjoyed by selecting varieties not previously grown, for many of them are very beautiful. Box stuff should be grown well; only so are the plants satisfactory. There is some art in growing good box plants, to be learned only by experience. The compost used must be made fairly rich by adding a proportion of well-decayed manure. Prick off early, give no more shade than is found unavoidable, and keep the plants near the glass if in frames, and in a light position if in a house. Stand them out to harden when well grown.

THE HEMP INDUSTRY.

W. H. Ferris.

It was thought that the war would have a detrimental effect on the fibre industry, but there is little evidence of this at present. The majority of the mills in the Manawatu district are running at full pressure. It is rather early for fibre shipments in other districts, and it is probable mills in some localities will not resume operations until things are more settled.

The season has favoured early harvesting of the leaf. The swamps are in good condition, and the leaf is in a particularly healthy state, a vast improvement being noticeable on that of the leaf available during the past two seasons. The quality of the fibre reaching the grading-ports of Wellington and Foxton proves the soundness of the leaf now being milled. The weather has been ideal for hemp-milling, the good colour of the lines being graded showing that excellent bleaching-conditions must have been experienced. As the work of stripping is satisfactory, a high-class product is being turned out, millers evidently realizing that with the good leaf available it is a comparatively simple matter to turn out a choice fibre.

Given reasonable shipping facilities there is no need to feel alarmed as to the season's prospects. Everything points to an improved demand for binder-twine in Australia and America, and good values should therefore rule for New Zealand phormium-fibre.

The Approved Variety of Silver-beet.

Dark-green plain-leaved, with wide and silvery-white leaf-stalk.

COMMERCIAL INTELLIGENCE.

THE FIBRE-MARKET.

Relation of Phormium to some Rival Products.

The High Commissioner for New Zealand, the Hon. T. Mackenzie, has furnished the following interesting report on the fibre-market to the Prime Minister, the Right Hon. W. F. Massey, P.C. :—

On receipt of your memorandum of the 6th April, on the subject of the effect of the competition of German East African sisal hemp on New Zealand phormium in the Home market, I asked the Produce Department to go into the whole matter, and have now the honour to submit herewith the following report containing the information that has been gathered. The causes of the unsatisfactory state of the market for our hemp have been gone fully into, and I trust that the endeavours to throw light on the position will help producers in New Zealand to successfully meet the situation.

In my annual report for 1913 I drew special attention to the increasing exports of German East African sisal, and pointed out that the whole business was a remarkable record of progress, and bore testimony to German thoroughness and enterprise. The sisal-plant was introduced from Central America about seventeen years ago. It attains full growth in East Africa in about seven years, the first leaves being ready for cutting after three years' growth.

The following figures show the production since the cultivation was commenced :—

Year.	Quantity. Tons.	Year.	Quantity. Tons.
1901	15	1908	4,000
1902	225	1909	4,800
1903	350	1910	7,000
1904	800	1911	10,000
1905	1,400	1912	16,000
1906	1,600	1913	21,500
1907	3,000		

As was previously indicated, the majority of this fibre goes into consumption on the Continent and America. The hemp is shipped to Hamburg by a line of steamers which is subsidized by the German Government, and its sale is largely in the hands of one firm of merchants in that city, which employs two brokers for the purpose. On arrival the hemp is examined by the brokers, who issue quality reports to their clients, and business is then negotiated. The system savours of a monopoly, but it has been successfully maintained up to the present. I understand that one of the chief grievances of buyers of German sisal is that when purchasing for forward shipment they get no guarantee from Hamburg that the hemp will be shipped within a specified time, and are obliged to accept delivery when it suits the plantation-owners to deliver. Notwithstanding minor drawbacks of this nature there is no doubt that for certain purposes the hemp has gained a firm hold amongst certain classes of consumers. It would, however, be scarcely correct to say that its position has been obtained at the expense of the New Zealand fibre.

Inquiries have been made amongst the trade here with a view to ascertaining whether any preference exists amongst manufacturers for German East African

sisal hemp as against New Zealand. The general opinion seems to be that the two fibres are rather different in character, but that sisal stands relatively higher in estimation on account of its bright colour, strength, and exceptional cleanliness. As a general rule it fetches a higher price than does New Zealand, though at one time last year quotations were down almost level with those for "high-point fair." German sisal has not been taken up by English consumers so much as it has by manufacturers on the Continent and in America. It is used principally for binder-twine, and in the States sisal is much preferred for this purpose. It also possesses an advantage over New Zealand phormium in that it can be used for ropemaking, and I am informed that makers, having been able to rely on receiving sisal of a satisfactory quality, have started making a special kind of rope which they sell as "African" rope. It is largely used, especially on the Continent, for mixing with the better classes of manila hemp for ropes. I also understand that the German Government contracts for ropes stipulate for certain quantities of German East African sisal to be used in their manufacture (this provision probably being inserted in accordance with their characteristic desire to assist the industries of their own colonies). It must be admitted, therefore, that this sisal is undoubtedly becoming an important factor in the hard-fibre market. The output for the present year is estimated at 24,000 tons, and current quotations for No. 1 quality are about £1 above those for "Good-fair" New Zealand—namely, £27 per ton.

Generally speaking, the effect of the competition of this hemp on New Zealand phormium is rather indirect that direct, and does not solely account for the present unsatisfactory state of the New-Zealand-hemp market: other causes must be sought for.

The price of manila is, of course, the factor which chiefly affects the New Zealand article, and although present prices of phormium are lower than those of last year, they compare favourably with the average range of quotations for the preceding four years. The causes contributing to the falling-off in manila prices since the early part of 1913 were dealt with in my last annual report, but they may be briefly recapitulated here. Towards the latter end of 1912, owing to the reports of the damage done to the manila-hemp plantations by typhoons, &c., a big demand set in from speculators and consumers, which caused prices to rise considerably. New Zealand prices rose in sympathy, and millers in the Dominion largely increased their production. At the beginning of the year 1913 it was thought that the manila crop would be short to the extent of about 40 per cent., and the continuance of high prices was counted on by a large number in the trade. As time went on, however, consumers were observed to be keeping off the market, and this absence of demand caused prices to gradually fall away, New Zealand quotations moving in sympathy. As it turned out, consumers must have laid in sufficient stock to enable them to keep off the market, except for hand-to-mouth purchases, and in addition to this they found that German East African and Mexican sisal were relatively better value than either Manila or New Zealand hemp at the prices then being asked. The production of Mexican sisal for 1913 reached record figures, being 875,997 bales, as against 855,366 bales in 1912, and 713,008 for the previous year, and owing to the Mexican difficulty the Americans obtained supplies of this fibre at comparatively low prices.

Here it will be profitable to consider the position in regard to Mexican sisal, which is recognized as a strong competitor with New Zealand hemp. Practically the whole output from Yucatan is taken by two or three firms in the States—the International Harvester Company and the Plymouth Cordage Company being the chief. The former alone absorb close on 600,000 bales, while the latter also take a large amount, leaving very little for others. As I have previously pointed out, the quantity coming to Europe in 1913 was only 8,619 bales, or less than 1 per cent. These two firms practically command the binder-twine industry. There are now two large American-owned mills in Europe—one in Germany and one in France—with an output between them of from 15,000 to 20,000 tons of twine. Of course, there are several other firms both in this country and on the Continent who also produce a certain amount of twine, principally using New Zealand phormium for the purpose.

You will remember that some time ago I reported to you the details of the Mexican Government's valorization scheme, which was designed to assist the producers to stand up against the efforts of the American trusts to depress prices. Since this came into force, however, political affairs in that country have been going from bad to worse, and although it cannot be ascertained definitely whether

the scheme has been thrown over or not, from the great difficulty the Government have experienced in obtaining money for any purpose whatever it must have become a dead-letter long ago. At the present time the quotation is down to about 5⅜ cents, equal to, say, £25 10s. per ton c.i.f. Europe, but this quotation must be regarded as a more or less fictitious one, in view of exchange fluctuations. The producers are no doubt extremely anxious to convert their stocks into money, and, as pointed out in recent produce cablegrams, shippers have evidently been using all their endeavours to get their hemp away. Shipments for the first four months of this year total 382,398 bales, as against 199,172 bales last year, while stocks on hand in progress at the beginning of May were only 40,957 bales, against 127,009 bales at the same time last year.

If the political troubles are not settled, and war breaks out, the probable result is that shipments will be held up, which would undoubtedly have the effect of raising prices, and all fibres should then benefit to a greater or less extent. In some quarters it is thought that the United States houses have foreseen this, and have laid in sufficient stocks to meet their requirements for this season; but against this may be set the certainty that with the excellent prospects for growing crops of wheat, oats, rye, and barley there will be an enormous demand for binder-twine, which will in itself afford a good market for the fibre. I understand also that the use of the binder for rice and maize is extending in the States.

The following figures of the exports of binder-twine from the United States have been supplied to me from a reliable source: they furnish some explanation of the enormous shipments from Yucatan, and indicate that the great volume of these is probably due to actual manufacturing requirements:—

For the nine months ending—	lb.	Value. $
31st March, 1914	83,082,291	7,198,713
31st March, 1913	80,535,186	5,767,400
31st March, 1912	81,215,085	5,296,170

The production of Mexican sisal for the present year is estimated to reach 1,000,000 bales. Bearing in mind that the average weight per bale is about 4 cwt., it will be found that the total weight will exceed the total production of manila hemp.

In Java, too, sisal-production is going ahead rapidly. The exports from there last year were about 10,000 tons, while this year they are expected to reach about 14,000 tons. This fibre approximates to the German East African variety, and the Dutch have somewhat similar shipping and selling arrangements—all consignments going direct to Amsterdam, business being done from there.

Summing up the position, therefore, it will be found that the two principal causes of the unsatisfactory state of the New Zealand market are: (1) The steady decline in prices for manila hemp; and (2) the increase in production of sisal—principally Mexican, but also to a certain extent German East African and Javan.

A few general observations for the consideration of producers in New Zealand may be here submitted:—

Constant touch is maintained by the Produce Section of my Department with the hemp-market here, and on all sides complaints are heard as to the unsatisfactory methods adopted by shippers in the Dominion in disposing of their hemp. The chief cause of dissatisfaction is that they will not follow the market, and fail to meet the demand. This tendency, although not unknown a few years ago, seems to become more emphasized as time goes on. The conditions of trade here are such that merchants and dealers in this country finance practically 95 per cent. of the ropemakers in Europe. Spinners are in the position of having to make contracts for twine months ahead, and in large quantities, reaching often to as much as 2,000 or 3,000 tons. The spinners naturally have to protect themselves, and consequently merchants are compelled to make contracts guaranteeing deliveries of hemp over long periods, which is, of course, most speculative. It was this speculative demand which formerly helped New Zealand hemp considerably: firms were willing to take risks when it was possible to obtain fairly large quantities from shippers in the Dominion.

It was previously an easy matter for merchants here to accumulate purchases of phormium to the extent of 5,000 or 6,000 tons, and New Zealand hemp was an article always being dealt with and discussed on Mincing Lake Market. For some time past, however, shippers have adopted different tactics. Instead of

recognizing that their fibre is only of value to spinners here if obtainable at a competitive price they seemed to hold off, under the impression that some special value attaches to it as compared with other fibres, and that it should therefore command a premium. From what has been stated above it will be seen that competition of other sorts has become very keen, and I am convinced that this will have to be recognized by our people if they desire improvement. Time after time experiences of merchants here with houses in the Dominion have been brought under the notice of my Department. A spinner gives an order to his broker for, say, 50 tons of New Zealand hemp, offers are cabled out by the broker to the shipper, and after an exchange of cables the order is executed. The broker learns he can do more business on the same basis, and suggests duplicating the order. Finding, however, that the shipper is not willing to sell any more, and that despite further cabling nothing will induce him to do so, except at a probably considerably increased price, the broker retires in disgust. This is said to be a common experience. Spinners get tired of it, and they turn away on to other fibres. Special inquiry has been made on this point. I am given to understand that with a little adjustment of their machinery manufacturers can change from phormium to sisal, for instance, and when once the change is made it is a difficult matter to induce them to go back again. It is this kind of thing that has given other fibres their opportunity, for it is nearly always possible to secure supplies of German East African: contracts for twelve months ahead are not unknown. There has recently been an increase in consignment business from New Zealand —owing no doubt to the adoption of methods above referred to—but, as can be readily understood, these consignments have met with opposition from brokers here, and low prices have had to be accepted, which must have resulted in serious loss to shippers. Instances have been given in which reasonable offers have been refused in New Zealand, and shippers have consigned, with the result that the parcels have fetched from £1 to £3 less per ton than they would have done had they been sold forward in order to meet the demand. This is another of the reasons put forward for the present unsatisfactory state of affairs.

Before leaving this matter there are two suggestions that may help to make for improving marketing conditions in connection with New Zealand hemp. These are,—

(1.) That particulars be regularly furnished to me by cable regarding production in the Dominion, the amount of hemp graded each month and ready for shipment, and also the estimated amount of production for, say, each quarter ahead. These details would give both merchants and manufacturers useful information as to what extent they could undertake trade commitments.

(2.) That every month statistics be furnished of quantities exported to (*a*) Europe, (*b*) American ports, and (*c*) Australia. This would give dealers an idea of movements in competing centres, and would tend to stabalize values.

A matter of considerable interest to hemp-millers in the Dominion is that the United States Government has recently passed an Act directing that manila hemp shall be graded on and after the 1st January next. It is thought that this step may recover some of the ground that has undoubtedly been lost by manila during the past few years. It will be interesting to note what effect the new law has on the fibre-market as a whole, but from the point of view of New Zealand I think that the influence will not be too favourable. I think that, owing to the difficulty of getting regular lines of manila in the past, certain firms who required a given standard of hemp have perhaps preferred to take New Zealand, as owing to our grading system they could rely on getting the required quality. The new system will naturally give them a better guarantee of obtaining what they want, and to this extent New Zealand may suffer. However, this point is a moot one, and some here seem to think that the new move has come some years too late. Of course, there is the possibility that an improvement in quality will result in an increase in manila prices, and should this happen New Zealand fibre should benefit in turn.

I trust this report will be of use to millers and producers in the Dominion. I am convinced that if shippers will give the points I have raised serious consideration, and act on their conclusions, the result will be to the betterment of the industry as a whole.

CALIFORNIAN MARKETS.

E. Clifton.

The anticipation of the effect of the arrival of the first consignments of butter from New Zealand and Australia is being discussed by the journals of the cities on the Pacific.

It is freely believed that the advent of the butter from the Antipodes will result in an immediate reduction of the price. It is surely to be expected that the advent of this butter plus that now held in storage will very decidedly modify market quotations. At the same time it is as certain that the price of good quality of butter will not be materially less when it reaches the retailer, and very assuredly the consumer will not find the cost of the butter appreciably modified. At the present time the householder is paying up to 35 cents (1s. 5½d.) per pound.

The wholesale quotations are, in this market on the 6th instant: "extra" butter, 24½ cents (equals 1s. 0¼d. per pound); "firsts," 23 cents (equals 11½d. per pound).

It would appear difficult to understand how New Zealand butter can be imported here at any great profit—indeed, how it can be so imported at all except at a loss—that is, if the quotations of values in New Zealand are correctly given here. The quotation of butter in New Zealand is here given as 22 cents; this with freight and charges would apparently bring the cost of the butter landed at San Francisco to 25 cents—1s. 0½d. per pound, or but a fraction over the prices to-day quoted as ruling on this market.

The great distributing centre of Seattle is to be represented in New Zealand by Mr. E. J. Shackleford, who is now leaving for New Zealand. He will make Auckland his headquarters. This gentleman will represent a number of packing firms (produce-merchants) of Seattle. His operations will include the whole range of food products. He leaves with the anticipation of arranging that the first shipment may arrive at Seattle in September. In this Mr. Shackleford has not appreciated the fact that the New Zealand market for butter does not open until later in the season. Still, all this shows the anxiety of these merchants to secure the food products of New Zealand.

It now rests with our exporters to supply only butter and other food products of the highest quality, and to be certain to make all sales on the certificate of the grader. This should be closely and jealously guarded. The grader's certificate or grade-note is the protection of the New Zealand seller.

The Egg-market.

"Extra" eggs, per dozen, 1s. 0¾d.; "firsts," per dozen, 11¼d. Here the activity of the Seattle merchants is shown. The Bradner Company of that city is already in the field. Arrangements have been completed to import New Zealand eggs. A member of the firm proceeds to New Zealand to be at hand at the beginning of the season. It is recognized that no great number of eggs can be bought in New Zealand at present, but as the seasons are opposite, all eggs that can be obtained are valuable here at Seattle in November and December.

San Francisco, 7th July.

RUSSIA SHIPPING THROUGH VLADIVOSTOK.

As an example of the eagerness with which all questions of the distribution of food products is being taken up the following is instanced: It is notified that there is another competitor for trading in food products from the countries bordering on the Pacific. Russia is, it is said, preparing to take advantage of the line of steamships, fitted with refrigeration-chambers, that will sail from Vladivostok. The note goes on to describe the railway-cars that will make the long journey through Russia in Europe and Asia. These cars will distribute their freights in Siberian cities. They are to reload with meat and butter, and to finally deliver their food products to ships at Vladivostok—it is assumed, to Europe via Panama. It is not suggested that there need be immediate apprehension on the part of New Zealand in respect of this announced competition.—*E. Clifton.*

THE FRUIT CROP.

The officers of the Orchards, Gardens, and Apiaries Division report as follows on the condition of the fruit crop at the end of August :—

Whangarei.—Lemons, good average crop; strawberries, looking well; loquats, medium crop; oranges (Poor-man), crop finished. The end of the month has seen the majority of the orchardists with their seasonable work well in hand, the last ten days or so being very favourable for completion of winter spraying. American and Japanese plums are showing a profusion of blossom, and most of the later varieties of peaches are in full bloom. Although the month has been wet and rather rough, the rainfall is below the average.—*J. W. Collard.*

Auckland North.—Apples, present appearances promise good crop; cherries, good prospects; lemons, looking well; nectarines and peaches, showing abundance of blossom; pears, trees looking well; plums, English promise well, Japanese in full bloom; tomatoes, house crops looking well.—*W. C. Thompson.*

Auckland South.—Apples: All winter spraying is now finished, and a very much larger quantity of oils have been used this season. Apricots: Every indication of a heavy blossoming; in some instances the trees are in full bloom. Lemons: Looking well. Nectarines and peaches: Every indication of a heavy blossoming, and a larger area has this season been sprayed with Bordeaux. Plums (English and Japanese): Every indication of a heavy blossoming. Strawberries: These are looking exceptionally well owing to the past month being warm with very little rain. Tomatoes: A few early varieties now being planted.—*N. R. Pierce.*

Poverty Bay.—August generally has been ideal for the carrying-out of orchard operations such as pruning, cultivation, spraying pip-fruits with red oil and stone-fruits with Bordeaux. At time of writing, blossoming of stone-fruits is not as forward this season as it has been the past two years. Given favourable conditions there is every prospect of a very heavy crop of peaches and Japanese plums, also good crops of pears and apples. Of course, compared with other districts the planting here has been slight, but it is the heaviest that has taken place in this district for very many years, and I think only the forerunner of increased planting to come.—*W. R. L. Williams.*

Hamilton.—The weather during the fore part of the month was rather wet, but the latter half has been very dry and warm. Winter spraying and pruning of apple-trees is still proceeding. Japanese plums are bursting forth into bloom, and the buds of many varieties of peaches and nectarines are swelling rapidly and give promise of an abundant crop. Planting is practically completed for another season. Ploughing and cultivating is in progress in some localities, but not to any great extent so far.—*T. E. Rodda.*

Hastings.—Apples, apricots, cherries, and gooseberries are looking well, also nectarines, peaches, pears, and plums. The weather-conditions during the month have been ideal from an orchardist's point of view, resulting in all orchard-work being well in hand. Indications of good crops of all classes of fruit are very favourable. The lime-sulphur spray as an insecticide and fungicide is being thoroughly tested this season.—*J. A. Campbell.*

Wanganui.—Apples looking well; prospects good; more spur pruning to avoid overcropping is essential. Apricots are flowering well. Cherries are looking well and up to the average. Gooseberries: Prospects are good, and early where they get attention. Lemons: Excellent crops have been gathered. The development of this line is an interesting feature in present-day orcharding. Nectarines and peaches considerably blighted. The making and application of Bordeaux and other fungicides require much more consideration than they are getting. Pears and English plums: Prospects well up to the average. Plums (Japanese): More

attention required to secure a good sample. Raspberries: Considerable planting being done. Strawberries: Area reduced. Tomatoes: Some good inside crops well under way; considerable preparations for outside planting.—*W. C. Hyde.*

Palmerston North.—During the past month the weather has been very favourable for spraying and pruning, and consequently the majority of growers have finished and are now turning their attention to cultivation. Much more spraying has been done than formerly, and the trees appear to be in a very healthy condition. The buds in all fruit-trees have developed very rapidly during the last few days, and everything points to a good season. Large quantities of lime-sulphur solution have been used during the winter, and many growers intend using it in spring and summer instead of Bordeaux mixture.—*George Stratford.*

Wellington.—The oil spraying, "winter strength," is practically over in this district. There is a vast improvement in the winter spraying, and even the very small growers have come to the conclusion that it is necessary to spray for the control of disease. The spraying with Bordeaux mixture is in full swing. Some growers are using lime-sulphur in place of the former. Everything points to an early spring. The peaches are showing a fair amount of bloom, while cherry-plums are out in full bloom. The local nurseries have had great demands for fruit-trees, and some varieties are not obtainable. The war has not appreciably interfered with orchard operations.—*T. C. Webb, jun.*

Nelson.—The weather for the month has been exceptionally fine, and orchard-work is well forward. A few growers are still spraying with oil washes, while others are busy with lime-sulphur or Bordeaux mixture. The orchards generally show evidence of a liberal dressing of one or other of these mixtures. Orchard planting is well forward, the season being a very favourable one for this work. Cherry-plums are well in bloom, as are also some varieties of peaches; others are well forward. Apricots are also bursting into blossom, and, like peaches, promise an abundance of bloom. Greater attention has been given to green-manuring, especially in the young orchards of the Tasman district, from 300 to 400 acres being laid down in oats for this purpose. Several orchards in the Stoke district are also carrying crops of oats or peas for ploughing under. Strawberries have suffered a good deal from the ravages of the grass-grub.—*J. H. Thorp.*

Blenheim.—Winter spraying and pruning practically finished for this season. Planting of young trees (mainly apples) still going on extensively in various parts of the district. The new fruit acre has found great favour here, and is used by all the leading growers. Peaches: A few early varieties in bloom. Apricots: Just bursting into bloom. Plums (Japanese): Just bursting into bloom.—*B. G. Goodwin.*

North Canterbury.—The weather has been very dry during the past month. Orchard-work is well advanced. The pruning and oil spraying is nearly finished. A few growers here are using the lime-sulphur wash this winter. Planting is now nearly finished for the season. Owing to the difficulty of getting trees some orchardists have not been able to plant as much as was intended. The markets are still well supplied with apples. The prices are not quite so good as they were a month ago.—*W. J. Courtier.*

Christchurch.—From a grower's point of view August was all that could be desired for forwarding spraying and other operations. The planting of tomatoes under glass is well advanced. This branch of the industry is steadily expanding in Christchurch.—*G. Esam.*

Timaru.—The advanced climatic conditions that have prevailed during August have had a stimulating effect on all plant-growth. Peaches, apricots, and some varieties of plums in a favoured environment are to be seen in flower. Low temperatures are to be expected in this belt owing to recent falls of snow on the surrounding hills. A number of growers are still busy spraying and pruning. Some raspberry-plants sprayed with red oil are bursting into foliage, whilst those not similarly treated in the adjacent rows are quite dormant. Young tomato-plants are doing well in the seed-pans under glass.—*A. B. Mansfield.*

Dunedin.—The weather still continues mild. All classes of fruit-trees are showing up well, and a few early ones are breaking into bloom. Tomatoes: Houses are being put in order and young plants are now being set out.—*W. T. Goodwin.*

HONEY-CROP PROSPECTS.

The Director of the Orchards, Gardens, and Apiaries Division has received the following reports concerning the honey-crop prospects from the Apiary Instructors:—

AUCKLAND.—The honey-market in Auckland is rather quiet at present. Local merchants report having sufficient in stock to last until the new season's supply comes in. Bees so far have wintered well, the weather having been exceptionally good. In the Bay of Plenty districts the bees have been busy on the blue-gums and tea-tree, and were storing honey and building comb in August. There are very few commercial beekeepers in the Bay of Plenty, and those seeking new districts would do well to spy out this "promised land" before deciding elsewhere, as it will undoubtedly be a great district for bees in the near future. The returns of the first shipment of graded honey from Auckland per the "Rangatira" are now to hand. The prices ranged from 42s. to 51s. per cwt.—*G. V. Westbrooke.*

WELLINGTON.—The conditions in the provinces under my jurisdiction have been ideal for setting the foundation for an excellent honey crop. Young clover-plants are particularly conspicuous in the pastures, and should the present weather continue, with occasional showers of rain, the prospects of a good surplus will be particularly bright. Last season's crop having been disposed of by nearly all the beekeepers, the prices ruling for honey coming forward now are good. The retailers, however, are more anxious than formerly to purchase honey in saleable packages rather than in bulk, due no doubt to the increased action of the producers in putting their produce up in this form.—*F. A. Jacobsen.*

CHRISTCHURCH.—The local market is steady, and prices unaltered—viz., 3¾d. to 4¼d. Beeswax, 1s. to 1s. 4d. according to quality. Active work within the hive has begun, and strong stocks have nice patches of brood. Pollen is being gathered freely from a variety of spring bloom. I would strongly recommend beekeepers to keep a close watch on stores at this season of the year, as with the rapid development of brood it is indeed surprising how quickly they diminish. A few pounds of sugar made into syrup will both produce bees and keep many a promising colony from death by starvation.—*L. Bowman.*

DUNEDIN.—There is little fresh to report. Auctioneers advise that the market is dull and sales slow for bulk honey. Pat honey is moving off slowly. Sections are scarce. Beeswax is scarce. Market quotations, 1s. 4d. to 1s. 5d. per lb.—*E. A. Earp.*

MARKET CONDITION OF LOCAL FRUIT AND VEGETABLES.

THE Fruit Inspectors of the Orchards, Gardens, and Apiaries Division report as follows on the condition of locally grown fruit and vegetables in shops and auction-rooms, and the market position of these for the month of August:—

AUCKLAND.—Business in the fruit-markets during the month has been very fair. Local apples have been coming forward in fair supply, and prices are steady. Lemons are plentiful, and prices have consequently dropped. Tasmanian Sturmers are arriving every week, but being only second class are not making good prices. Good potatoes and onions are in rather short supply, and prices are good. Large supplies of cabbages and cauliflowers are coming forward. Average prices for the month are: Apples—best dessert, 9s.; good, 7s. 6d. to 8s.; others, 6s. to 7s.; cookers, 7s. 6d. Lemons—prime, 7s.; good, 5s. to 6s.; rough and coarse, 3s. 6d. to 4s. Poor-man oranges, 5s. 6d. to 6s. Pears—good, 9s.; cooking, 7s. 6d. Grapes (hothouse), 1s. 10d. to 2s. per lb. Tomatoes, 10d. to 1s. per lb. Potatoes,

good, £4 10s. to £6 per ton. Onions, good, 8s. per cwt. Pumpkins—best 5s., others 2s. to 4s., per cwt. Cauliflowers, 2s. 9d. to 3s. 6d. per sack. Cabbages, 3s. to 4s. per sack.—*C. Berridge.*

Wellington.—Apples are arriving in small quantities from the Nelson District, and prices are fair. All other fruits are scarce. Vegetables are in good demand, and prices are good. Approximate prices are as follows: Apples—Rome Beauty, 7s. to 8s.; Rymer, 5s. 6d. to 6s.; Jonathan, 5s. 6d. to 7s.; Washington, 6s. to 8s.; Sturmers, 5s. to 8s.; cookers, 4s. 6d. to 7s.; all at per case. Vegetables: French beans, 1s. 5d. per lb. Cabbages—choice, 9s. to 12s. per sack; others from 3s. to 8s. per sack. Cauliflowers—choice 13s. to 18s., others from 8s. 6d., per sack. Cucumbers, 5s. to 12s. per dozen. Onions, £5 10s. per ton. Potatoes, £4 10s. per ton. All other vegetables are bringing satisfactory prices.—*T. C. Webb, jun.*

Christchurch.—The only local fruits of any moment on the market at the present time are apples and Poor-man oranges. Apples are in good supply, and the market is slightly easier, 6s. to 8s. now ruling. Poor-man oranges realize from 10s. to 11s.—*G. Esam.*

Dunedin.—Very small quantities of local fruit are now being handled at this centre. Occasional small lots of late apples are coming forward from Canterbury and Otago Central, and the following prices are being realized: Apples—choice cooking, 2d. to 3d. per lb.; second-quality cooking, 1¼d. to 1¾d. per lb.; choice dessert, 8s. 6d. to 10s. per case; second-quality dessert, 7s. 6d. to 9s. per case.—*C. Craigie.*

Invercargill.—On the Invercargill market this month the only locally grown fruit has been Auckland Poor-man oranges, and apples and pears grown in Canterbury and Central Otago. The condition of the fruit has been irregular, but mostly of good quality. Fruit has been scarce, and has commanded good prices. Vegetables (cauliflower, cabbage, and roots) have been plentiful, and obtainable at moderate prices. Current wholesale prices for the month were: Apples—dessert, 9s. to 11s. per case; cooking, 7s. to 8s. Pears, 7s. to 10s. Poor-man oranges, 10s. to 12s. Potatoes—table, £4 to £5 per ton; on trucks at country stations, £3 to £3 10s.; seed, £3. Onions, 6s. to 7s. per cwt. Carrots, 2s. to 3s. per bag. Parsnips, 2s. to 3s. per bag. Cabbages, 3s. to 4s. per sack. Cauliflowers, 4s. to 6s. 6d. per sack. Swedes, 2s. per sack.—*R. Hutton.*

AGRICULTURAL SHOW DATES.

International Dry-farming Congress and International Soil-products Exposition, Wichita, Kansas, U.S.A., 7th to 17th October.

Hawke's Bay A. and P. Society.—Hastings, 21st and 22nd October.

Dannevirke District A. and P. Association.—Dannevirke, 10th and 11th February; Ram Fair, 12th February.

In forwarding his renewal subscription an Otago supporter of the *Journal* writes, "Owing to this valuable journal I am honestly compelled to say I have trebled my income."

Hereditary Transmission.—I am quite prepared to believe the remarkable case of hereditary transmission reported in the *Journal* of July, as I know of a calf that was born with its mother's brand on it, the brand being exactly in the same position as that of the mother's.—*George Gwen, Walton.*

ANSWERS TO CORRESPONDENTS.

CORRESPONDENTS are requested, when desiring information through the Journal in regard to disease in animals and plants, to forward, where possible, affected specimens, in order to facilitate a correct diagnosis of the trouble and to ensure the best advice. In stating a question the most complete descriptive details should be furnished.

Correspondents desiring information in regard to manurial treatment of soil are requested to fill in and forward the prescribed form—"Application for Advice as to Manurial Treatment of Soil"—obtainable from any office of the Department in the Dominion.

In every instance a question to which an answer is desired in these columns must be accompanied by the full name of the inquirer, not necessarily for publication, but as a guarantee of good faith.

Cow-bails.

Mr. W. H. Schmidt, Bombay :—

Would the iron-piping stanchions used in America be practical here as bails? Also, would you kindly let me have a plan of six-bail cow-shed, concrete floors, &c.?

The Dairy-produce Division :—

Iron-pipe stanchions are eminently suitable for the purpose mentioned, and some of the sheds in New Zealand have been fitted up in this manner. When iron piping is used for this purpose it has the double advantage of being durable and more easily kept in a sanitary condition than wood. Copies of plans of cow-sheds are being mailed to your address.

Goats and Blackberry.

Mr. Francis Tasker, Ruapuwa, Canterbury :—

I have often heard that goats are used very successfully for the eradication of blackberry. Is it a sure way of getting rid of them? Does the blackberry die off when bitten by the goat, or do they have to be fed off continually? Can you tell me where I can purchase a goat or goats anywhere in Canterbury?

The Fields and Experimental Farms Division :—

Blackberry does not die off immediately after being eaten down by goats, but if the goats are kept on it continuously for some time (probably a few years) it will gradually disappear. If you intend to purchase goats, it is suggested that you should procure Angoras, as a return can be obtained from the sale of their hair. Probably Messrs. Dalgety and Co., of Christchurch, would be able to tell you where goats are obtainable in Canterbury.

Westland "Pakihi" Land.

Mr. W. H. Chinn, Matainui, Hokitika :—

Please inform me what is the best grass to sow on Westland "pakihi" land. The land is covered with fern, and is fairly dry, but of a sour nature. What is the best time to burn the fern and sow the seed?

The Fields and Experimental Farms Division :—

The Department is at present conducting experiments on pakihi land in Westland with a view to ascertaining the most suitable grasses for such country. Final conclusions have not yet been arrived at. Owing to the peaty formation of the surface of the pakihi land it is very doubtful as to whether any variety of grasses could be successfully grown on such land until it is first of all drained, limed, and ploughed, as the sourness of this class of land is prejudicial to the growth of most grasses. The following grasses are recommended to be sown in spring : Timothy, Italian rye-grass, danthonia, birdsfoot trefoil (major), white clover, alsike, cow-grass. It would be difficult to state the best time to burn the fern, as this would depend greatly upon the dryness of the season. Spring sowing has done best so far on such soils.

Scouring in Young Cattle.

"A Subscriber," Ellesmere :—

Can you explain the cause of scouring in young cattle about eight months old ? They are getting all the dry feed it is possible to give them, with plenty of young grass besides. The scouring is constant, and probably only half recover. Do you believe in breeding stock from too closely related animals, or does it weaken the constitution ?

The Director of the Live-stock and Meat Division :—

The probable cause of scouring in your young cattle is parasitic. I would advise you to give each 1 teaspoonful of lysol in 1 pint of milk for four mornings. Then miss three or four days, and if no improvement is noticed give four more doses. I do not believe in breeding from closely related stock. The first two or three crosses may be all right, but eventually weaknesses develop which were not present in their foreparents but will be reproduced in their progeny.

Silver-beet at Sunnyside.

W. B., Keokeo :—

In the *Journal* dated 20th April, 1914, there appears on page 379 an article on silver-beet experiments carried out at Sunnyside Mental Hospital. We notice the seed was drilled in on the flat in both cases, but no mention was made of what seed was used. We think the amount of seed per acre and the manure used should be published in your next issue as being of interest to those who have not sown it.

The Fields and Experimental Farms Division :—

The variety sown was the plain pale-green leaf with broad silvery-white stem and thick midrib. The seeding was at the rate of 7 lb. per acre. The land had been top-dressed with farmyard manure (15 tons per acre) after a crop of mangels.

Swedes.—Lucerne.

Mr. W. N. Wardrop, Waimarino :—

Last year I had a 2-acre paddock down in Superlative swedes, but with very poor results. I manured with superphosphate, 1 cwt. per acre. The land is of medium quality, manuka having originally grown on it. I forward by post a sample for analysis. This coming spring I intend trying swedes again. What kind of manure and how much shall I drill in with the seed ? If after this crop I plough the ground again at the end of winter, would it be suitable for lucerne the following year ? The land is elevated, flat, and dry, with limestone formation. We have a lot of rain and severe frosts.

The Fields and Experimental Farms Division :—

After having thoroughly worked the land sow with the swedes about 2 cwt. superphosphate and 1 cwt. blood and bone. An application of lime in winter, at the

rate of 1 ton per acre of finely ground limestone or ½ ton burnt lime, preferably the former, would be advantageous. Manuka land as a rule requires lime, even though the underlying rock is of limestone formation. Should the soil after swedes be clean—drilling and cultivation of the roots should clean it—and possess a fairly free open subsoil, it would be suitable for lucerne. The lime could be worked in during the winter to the great advantage of the lucerne crop. For success with this crop it had better be sown in drills about 10 in. apart, so that it can be cultivated. As manure, use 3 cwt. basic slag and 1 cwt. sulphate of potash, the former worked in as early as possible before sowing the seed. The soil had better be inoculated by taking about 3 cwt. per acre of soil that has already grown lucerne successfully, storing it in a dark damp place, and harrowing it well into the soil in the evening when the light is obscure.

COW-PEAS.

J. A., Maungaturoto :—

I want to get to know all I can about cow-peas. What is the best kind to plant? When should it be planted, and how much seed per acre is required when sown broadcast by hand? Can this pea be grazed off by cows, or is it best to cut and feed? If the crop can be grazed off, at what stage is it best to turn stock on? Will the crop spring up again after being eaten down?

The Fields and Experimental Farms Division :—

The varieties giving best results in parts of America with climate somewhat similar to your conditions are the Clay, Whip-poor-Will, Wonderful, and New Era. As the cow-pea requires warmth and a fair amount of moisture, it should be planted in late spring (say, end of October), or it could be grown as a catch-crop in late summer or early autumn—at last cultivation of maize or on stubble. If the land is thoroughly clean it can be grown broadcast, the rate of seeding being 60 lb. to 90 lb. per acre, it being a slow germinator and is hence liable to be smothered by weeds. If the land is anyway troubled with weeds it is better to sow in drills about 18 in. to 2 ft. apart and cultivate. Stubble land, of course, would be clean. Sown in drills use about 30 lb. of seed per acre. The cow-pea is suitable for grazing, but being an annual it does not come away the second time. For this reason it is employed as a catch-crop in America for feeding off or for green-manuring. As a soil-improver it has few equals. It is best to feed off when not too mature, for then there is a greater freshness of feed. It makes an excellent soiling (for cutting green) crop, also a hay crop, there being, of course, less waste by these practices. The state of your pastures, labour available, also success of crop, will enable you to decide which practice is best. When there is sufficient warmth for its successful growth and provided you have worked the land well, do not despair about successfully growing it if you obtain only partial success the first year. Like lucerne, if you plough under the partial growth, you greatly encourage inoculation of the soil with the right species of bacteria, and in all probability you will obtain success in the second year. The previous growth of partridge-peas will inoculate the soil for the successful growth of cow-peas. As with lucerne, use lime and phosphates and potash fertilizers.

MANURING POTATOES.

"POTATOES," Whakatane :—

How is the manure for potatoes applied: is it put on with the potatoes, or is it put on the surface of the ground afterwards?

The Fields and Experimental Farms Division :—

The manures can either be worked well into the soil before planting, or applied in the drill with the seed. The former system encourages the plant to search for its food, hence spread out more and develop a greater rooting (feeding) system, while the drill method would cause a more rapid growth and deeper-rooting system. The latter method would be more desirable in a dry climate or during a dry season. Only readily soluble fertilizers, such as nitrate of soda, would be applied on top of the ground. Under your seasonal conditions, as far as is known, we would advise sowing the manures in the drill.

Grassing Shingly Land.

Mr. G. S. Haycock, Brightwater :—

What is the best mixture of grass-seed for hilly land, shingly, rather loose, and inclined to run in places ? The soil is dark chocolate in colour and does not face towards the sun. Hitherto we have used mainly cocksfoot and Chewing's fescue, with white clover, trefoil, and danthonia. Would tall fescue root and bind well on shingly land ?

The Fields and Experimental Farms Division :—

The mixture you are using should be fairly satisfactory, but it would probably be improved by the addition of red-top, brown-top, and tall oat-grass—say, 2 lb. of each to 1 acre. Tall fescue would have no binding effect and would not be advisable to use.

White Clover.—Concrete Pipes.

C. V. R., Brydone :—

Will you inform me when to sow white-clover seed, by itself, and how much is required per acre ? I have a small paddock of 7 or 8 acres which I am going to sow down in rye at the present time for the cows to eat off as soon as ready. I then intend to lime at the rate of 1 ton per acre and sow down in white clover. My land is of a sandy nature. Do you advise sowing the clover in autumn or spring ? Could I cut it for seed the first year or would I have to wait for the second year ?

Would you also inform me what strength of cement is required for concrete pipes 2 ft. in diameter ?

The Fields and Experimental Farms Division :—

Sow the white clover in the spring (October in Southland) and sow alone at the rate of 6 lb. to 8 lb. per acre. Cut for seed in the second year. Your land, being of a sandy nature, will probably be somewhat deficient in potash, which is the dominant constituent of a fertilizer for clovers. Hence about 2 cwt. per acre of kainit, together with about 1 cwt. per acre of guano, would be good treatment. The lime should be applied in the form of finely ground limestone, and separate from the kainit and guano.

For concrete pipes 2 ft. in diameter use the ratio 1-1-3 : that is, one part of cement to one part of sand to three parts of gravel. These parts are by measure and not by weight. The gravel should be screened and the sand it contains reckoned as such.

Shelter-trees suitable for Fencing-posts.

"Subscriber," Gisborne :—

I intend planting half an acre of land with gums. Which are the best that will eventually do for fencing-timber ? Would you suggest putting in any other trees, and where can I obtain the seed ?

The Orchards, Gardens, and Apiaries Division :—

The black-wattle (*Acacia decurrens*) can be recommended as being suitable both for shelter and producing fairly durable timber for fencing-posts. The seed is stocked by most seedsmen.

Cropping in Orchard.

"Amateur," Hawke's Bay :—

I would be obliged if you could give me a few hints about cropping an orchard. I propose putting about 8 or 9 acres down in apples and pears, and I would like to know the best method of cropping between the trees until they come into profitable bearing. The soil is rich alluvial, getting sandy towards the river, the land being

all flat. Would it be possible or advisable to crop for four or five years by freely manuring, and what rotation would you advise? Is it advisable to use artificial manure as well as green manure? If so, should it be put in before the green manure or before the succeeding crop? When putting lime with green manure should it be put in before or after the green crop is sown?

The Orchards, Gardens, and Apiaries Division:—

There is no reason why such crops as potatoes, onions, tomatoes, or Cape gooseberries should not be planted between the rows of young fruit-trees, provided a reasonable space is left clear round each tree. Green-manuring is always desirable. It is better to apply lime before the crop is sown. Artificial manures will be required afterwards in connection with the crops above mentioned, in order to maintain the fertility of the soil.

Eradicating White Lily.

Mr. T. Wech, Warkworth:—

Please inform me how to eradicate the white lily. I have several patches in my orchard, and have tried picking out the roots, but they seem to come up thicker than ever.

The Orchards, Gardens, and Apiaries Division:—

We do not know that there is any other method by which you can eradicate white lily except by removing the roots. The use of an effective poison of any kind would leave an injurious effect upon the orchard-trees.

Apple-culture.

Mr. L. W. Storry, "Aotea," Christchurch:—

What are the best eighteen varieties of apples to plant for a farm orchard?

The Orchards, Gardens, and Apiaries Division:—

Eighteen varieties seem too large a number for a farm orchard. Among the best varieties of apples are—Beauty of Bath, Ballarat Seedling, Delicious, Five-crown Pippin, Golden Pippin, Gravenstein, Jonathan, Lord Wolseley, Monroe's Favourite, Northern Spy, Reinette du Canada, Rhodes's Orange, Rymer, Scarlet Pearmain, Scarlet Queen, Statesman, Sturmer Pippin, Yates.

Lucerne.

"A Novice," Bombay, Auckland:—

Having recently taken over a farm with a paddock of last-year-sown lucerne, I should be glad if you will through the *Journal* give me some advice *re* same. I understand the patch was well manured and inoculated for lucerne, but the ground not having been thoroughly cleaned it is smothered with weeds. Inkweed made the patch look like a shrubbery. These have all been cut out, also the worst clumps of the three plants I enclose for identification, marked 1, 2, and 3 respectively. There seems a good stand of lucerne, but am afraid the weeds will smother it out. I propose to run the horse-rake over it later to collect the remains of inkweeds, &c., after which would it be advisable to harrow; if so, at what date?

The Fields and Experimental Farms Division:—

The lucerne not being well established, there is a risk of injury from excessive cultivation. The horse-raking would tend to cultivate the soil somewhat, and it might be better to horse-rake the land twice or thrice rather than run the risk of injury from severe tine-harrowing. The heavier the horse-rake used the better; in fact, weighting it would cause it to better perform the function of cultivation together with raking. To encourage the lucerne to get ahead of the weeds top-dress with about 2 cwt. of basic slag of finest grinding at as early a date as possible.

Grassing.

"Harbour," Raglan :—

After burning off last March I put in some cocksfoot, and a fair percentage of it seems to me to have withered. Some of the blades are quite dead from the tip to about half-way down. What is the cause? I am enclosing a few blades for inspection. I might say this is limestone country—a light soil of a fair quality (second class), broken to undulating. Where the grass is growing it has an easterly and northerly aspect. The timber on it is tall, heavy white manuka. There are some clear patches containing grass and weeds which are very close to the ground; no doubt they have been down for thirty years or more. It is impossible to plough some of the land. Would you advise a top-dressing of slag or any other manure, and how much per acre? I intend to clear and burn about 50 acres this year, and I want to milk twenty or more cows. What grasses would you advise, and how much per acre, and if the grass is sown in March would you also advise a top-dressing of slag about June?

The Fields and Experimental Farms Division :—

It would appear that the condition of your grass is due to a deficient supply of nitrogen. The soil is light in the first place, and surface burning on such soil would tend to burn out the organic matter (humus), thereby causing a diminished supply of nitrogen for the vigorous cocksfoot, which demands a fair quantity of this soil-constituent. Top-dressing with equal quantities of basic slag and superphosphate (say, 2 cwt. of each), *applied directly after mixing*, is recommended. This should be followed by 1 cwt. to 2 cwt. of blood and bone per acre. The latter is essential as a means of applying nitrogen principally, but cannot be mixed with the slag, hence it has to be applied separately. Should, however, the soil contain sufficient lime (which is doubtful with manuka land, even on limestone formation) you could apply superphosphate and blood and bone together (2 cwt. of each), in which case basic slag is not necessary. The following mixture should suit your soil: *Poa pratensis*, 2 lb.; *Poa trivialis*, 1 lb.; tall oat-grass, 3 lb.; perennial rye, 5 lb.; cocksfoot, 6 lb.: *Danthonia pilosa*, 3 lb.; red-top, 1 lb.; brown-top, 1 lb.; Chewing's fescue, 2 lb.; white clover, 2 lb.; alsike, 1 lb.; *Lotus angustissimus*, 1 lb.: 28 lb. per acre. With the above mixture the blood and bone could be sown, and the superphosphate and slag applied later (June or July) as a top-dressing. This treatment should give good results.

Cow-shed.

"Beginner," Hobsonville (Mr. W. Burrows) :—

Could you inform me how to build an up-to-date twelve-bail cow-shed for hand milking, and would bricks or concrete be better for the floor?

The Dairy-produce Division :—

We are to-day posting you plans of cow-sheds. As to the material for flooring, bricks are not suitable owing to the fact that it is difficult to make the joins completely tight, and also because the bricks are more or less porous and absorb the moisture. Concrete, on the other hand, is the best material that can be used for such a purpose.

System of Milking.

W. L. R., Rotorua, Waikato :—

Will you please tell me through the next *Journal* would it harm a cow at all if, instead of milking first the two hind teats and then the two fore teats, I milk one fore and one hind teat together, and then the remaining fore and hind teats. I find this way much easier when milking the cow from the left instead of the right side.

The Dairy-produce Division :—

Although the method of milking described is unusual, it cannot be stated that this would be harmful to the animal.

BORDEAUX MIXTURE.

MR. W. PARKES, Huntly :—

Kindly inform me *re* the composition of the 4-4-40 Bordeaux mixture as used for potato spray, and would the Department supply the ingredients for the purpose ?

The Orchards, Gardens, and Apiaries Division :—

The following is the composition of the 4-4-40 formula of the Bordeaux mixture : 4 lb. sulphate of copper ; 4 lb. fresh roche-lime (if fresh lime is not obtainable, use 5 lb. of ordinary washing-soda instead of 4 lb. lime) ; 40 gallons of water. Preparation : Dissolve the 4 lb. sulphate of copper in 20 gallons of water. Slake the 4 lb. of lime slowly, and make up to 20 gallons : strain this milk of lime into the solution of sulphate of copper, stirring briskly. Sulphate of copper may be dissolved by tying in a piece of sacking and suspending overnight just below the surface of the water, or by using hot water. Vessels of wood or earthenware should be used. Care should be taken to spray the under-sides of the leaves as well as the upper sides and the stems. This Department does not supply the ingredients for spraying, but there should be no difficulty in obtaining them from any seed-merchant.

BORONIA.

"BORONIA," Kaio :—

Kindly give me some advice on the culture of boronia—when it should be sown and the treatment necessary. I have made an attempt with its culture, but have not been successful.

The Orchards, Gardens, and Apiaries Division :—

The boronia belongs to a class of small shrubs that are not easy of propagation, such as the heaths, *Epacris*, &c. They are raised from cuttings from 3 in. to 4 in. long in well-drained pots filled with sandy peat with, say, half an inch of pure sand on the top, and the pots plunged into spent tan. They should have some heat—about 55° to 60°. The after-culture is not difficult. They may be seen doing well in any good garden-soil. A well-drained sandy soil seems, however, to suit them best. We would advise getting them from a nurseryman in preference to trying to raise them.

DEHORNING-BAIL FOR CATTLE.

MR. W. L. MARTIN, Mapiu, Taumarunui :—

I shall be obliged if you can give me the necessary details of a dehorning-bail.

The Live-stock and Meat Division :—

In dehorning cows the main thing is to have the animal's head properly secured. This can best be done in an ordinary cattle-crush with facilities for thoroughly securing the head. If you have not performed the operation before you should get some one to do it who is used to it. He would also know how to secure the animal's head.

BEES DYING.

MR. J. F. MISCHEWSKI, Wharehuea :—

Could you tell me what is the cause of bees dying out in the winter, with full stores of honey ?

The Orchards, Gardens, and Apiaries Division :—

There are several reasons why your bees may die in the winter although they have plenty of stores : (1) They may have foul-brood very badly, which is the most likely cause ; (2) they may have been queenlesss during the latter part of

last summer, consequently there would be no young bees to carry the colony through the winter; (3) they may have been weak, thus giving wax-moths an opportunity to attack the combs; (4) mice may have got into the hives and driven the bees out. Foul-brood is, however, the most likely cause.

HAY.

MR. H. GLENTWORTH, Urenui:—

What would be the best to sow with oats, for oaten hay? Would tares, peas, or red clover be suitable? Also, what would be a good manure to use with these? I am sowing them in ground that has been sown in turnips. Also kindly let me know the best variety of peas to sow for the above purpose.

The Fields and Experimental Farms Division:—

While peas or tares could be used for chaffing with oats, yet we would prefer red clover, and especially the taller-growing slower-maturing Mammoth or Perennial red clover. If your soil is well supplied with lime use 2 cwt. to 3 cwt per acre of superphosphate; if not, use basic superphosphate, and 1 cwt. to 2 cwt. blood-and-bone manure. Should you grow peas instead of clover, grow Early Britain, New Canadian Beauty, or Prussian Blue.

BUDA KALE.

G. H. G., Gordonton:—

Would Buda kale be a good crop to grow on kahikatea swamp land? Does it in any way affect the milk? What quantity of seed is necessary per acre, and what manure would be most suitable?

The Fields and Experimental Farms Division:—

Buda kale would be a good crop to grow on kahikatea swamp land provided this was fairly well drained. Sow about 4 lb. or 5 lb. per acre. On swamp use ½ to 1 ton per acre of ground burnt lime. As manure on swamp land use 3 cwt. to 5 cwt. basic slag, and 3 cwt. to 4 cwt. kainit or 2 cwt. muriate of potash. Nitrogenous manure is not necessary, there being an abundance of this in such soil. The earlier the lime, slag, and kainit are applied the better. Buda kale will not appreciably affect the milk if fed to the cows in strict moderation, or provided they were turned on to it for not more than two hours daily, after milking in either case. This is very important.

GREEN FEED.

"SUBSCRIBER," Sandon Block:—

I have a 4-acre paddock, which has only had one crop of swedes taken out of it. I thought of sowing barley and tares for autumn feed for milking-cows. I should like to know if, after being fed off and the paddock closed up during the winter, there would be feed for the cows the following spring; how often the above crop could be fed off before shutting up for the winter. Is there any other crop you would advise me to have in preference to barley and tares? I do not want a crop that has to be carted out. When would it be advisable to sow it, and what quantities of grain should be used per acre?

The Fields and Experimental Farms Division:—

Should you sow Cape barley there should be feed for the cows the following spring. The number of times the crop can be fed off will depend upon the richness of the soil and the season. However, under suitable conditions a few feedings may be obtained if not fed too closely. The vetches, of course, are not perennial, hence they do not supply continuous feed. Even in winter the Cape barley could be fed off and still supply spring feed. Emerald rye and black Scotch vetch or the hairy or winter vetch could be sown. The rye supplies continuous feeding, and is well suited for winter or spring feed. Sow 72 lb. per acre of Cape barley, 84 lb. per acre of Emerald rye, and 20 lb. to 25 lb. per acre of vetches.

HEMP AND TOW GRADING RETURNS.

AUGUST.

Hemp.—The total number of bales graded was 5,003, as compared with 8,153 for the corresponding month of last year, a decrease of 3,150 bales. For the twelve months ending 31st August, 1914, the number of bales graded was 126,319, as compared with 154,249 for the previous twelve months, the decrease being 27,930 bales.

Tow.—During the month 1,240 bales were dealt with, as compared with 2,545 for the corresponding month of last year, a decrease of 1,305 bales. For the twelve months ending 31st August, 1914, the number of bales graded was 40,635, as compared with 53,671 for the previous twelve months, a decrease of 13,036 bales.

Stripper-slips.—During the month the number of bales graded was 71, as compared with 243 for the corresponding month of last year, a decrease of 172 bales. For the twelve months ending 31st August, 1914, the number of bales dealt with was 3,388.

HEMP, TOW, AND STRIPPER-SLIPS GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF AUGUST, 1914.

Hemp.

Port.	Superior.	Fine.	Good-fair.	Fair.		Common.	Rejected.	Con-demned.	Total.
				High Point.	Low Point.				
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	..	157	397	330	66	35	..	985
Napier	..	..	..	..	..	..	..	..	..
Foxton ..	..	..	1,036	744	162	4	5	..	1,951
Wellington ..	..	8	441	1,243	110	..	..	..	1,802
Blenheim ..	..	..	..	..	..	..	..	..	..
Picton ..	..	..	..	..	..	..	..	..	..
Lyttelton ..	..	38	39	..	..	25	..	..	102
Dunedin ..	..	..	..	26	..	..	..	..	26
Bluff	..	..	..	122	15	..	..	..	137
Totals ..	..	46	1,673	2,532	617	95	40	..	5,003
Percentages of totals	..	0·92	33·44	50·61	12·33	1·90	0·80	..	..

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	132	153	45	330
Napier	..	..	..	..	..
Foxton ..	164	237	20	..	421
Wellington ..	103	239	31	..	373
Blenheim ..	..	..	..	..	..
Picton	..	..	..	..	..
Lyttelton ..	..	20	..	..	20
Dunedin ..	..	..	..	..	..
Bluff	..	4	92	..	96
Totals ..	267	632	296	45	1,240

Stripper-slips.—Passed for export: Foxton—First grade, 36; second grade, 31—total, 67. Wellington—Second grade, 4.

STOCK EXPORTED.

THE following table shows the numbers and descriptions of stock exported from the Dominion during the month of August:—

Port of Shipment.	Horses.			Sheep.			Cattle.			Pigs.		Dogs.		
	To Australia.	To Pacific Islands.	To London.	To Australia.	To Pacific Islands.	To South America.	To Australia.	To Pacific Islands.	To Montevideo.	To Australia.	To Pacific Islands.	To Australia.	To Pacific Islands.	To London.
Auckland ..	2	9	..	..	199	..	..	26	..	..	43	..	..	..
Gisborne ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Napier ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wellington	2	..	..	1	..	..	..	..	..	..	..	5	..	..
Lyttelton ..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Dunedin ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bluff ..	2	..	..	1	..	..	..	..	..	..	..	..	..	..
Totals ..	6	9	..	3	199	..	..	26	..	..	43	5	..	..

Auckland also exported 12 crates of poultry to Pacific islands.

Following are the particulars of horses exported: Thoroughbreds—1 mare, 1 filly; draughts—1 stallion, 2 mares, 4 geldings; 2 pony mares, 3 geldings, 1 hackney mare.

STOCK IN QUARANTINE.

THE following stock were received into quarantine during the month of August:—

No.	Description.	Sex.	Port of Origin.	Owner or Agent.	Address.
			MOTUIHI ISLAND (AUCKLAND).		
1	Fox-terrier ..	Female	London ..	G. R. Hutchison ..	Auckland.
			SOMES ISLAND (WELLINGTON).		
4	Pomeranian dogs	Female	London ..	H. Crompton ..	Newtown, Wellington.
1	Collie dog ..	Male ..	Liverpool ..	G. Cail	Masterton.
1	,, ..	Female	,, ..	,, ...	,,
1	,, ..	Male ..	,, ..	Turnbull, Martin, and Co.	Port Chalmers.
1	Harrier hound..	,, ..	London ..	Dr. Thomas (Secretary, South Canterbury Hunt Club)	Timaru.
2	Airedale terriers	,, ..	Liverpool ..	Joseph Liggins ..	Tokomaru, Shannon.
1	,,	Female	,, ..	,, ..	Ditto.
			QUAIL ISLAND (LYTTELTON).		
1	Bull-dog ..	Male ..	London ..	New Zealand Express Co. (Ltd.)	Dunedin.
1	,, ..	Female	,, ..	Ditto	,,
1	Harrier hound..	Male ..	,, ..	Dr. Thomas (Secretary, South Canterbury Hunt Club)	Timaru.